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ABSTRACT

In modern society, lifelong learning by the physician is essential. This study was conceived to: (1) define the educational needs of practitioners in the Pacific Northwest, (2) assess the resources available to meet these needs, (3) determine what educational programs are needed, (4) develop evaluation methods for these programs, (5) identify physician participation factors, (6) develop evaluation techniques for clinical communication systems, (7) evaluate recent continuing education programs, and (8) develop a comprehensive plan for a continuing education center. The report describes in detail the techniques used to accomplish these objectives, with questionnaires and survey results contained in the appendixes. Ideally, medical education should continue in a lifelong pattern developed during undergraduate study. With improvements in program content, promotional efforts, information networks, and program offerings in individual hospitals, continuing education can be made an integral part of physicians' careers. (BH)

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A STUDY OF CONTINUING EDUCATION IN THE PACIFIC NORTHWEST: FINAL REPORT

UNIVERSITY OF WASHINGTON
School of Medicine

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UNIVERSITY OF WASHINGTON

SCHOOL OF MEDICINE

STUDY OF CONTINUING MEDICAL EDUCATION FOR THE PURPOSE OF ESTABLISHING A DEMONSTRATION CENTER FOR CONTINUING EDUCATION IN THE PACIFIC NORTHWEST

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Performed under a contract with the
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PREFACE

In September, 1964, the Project Director, William O. Robertson, M.D., Associate Dean, outlined in a letter to the Dean of Medicine at the University of Washington the potentials of an Office of Research in Medical Education, were one created at the University of Washington (Appendix A). Received favorably, the next step involved seeking financial support. At approximately the same time, Dr. John Lein joined the University of Washington as Director of Continuing Medical Education; his acceptance of this position was the initial step in elevating the function of continuing medical education to a status equal to that of educating medical students and house officers. In his new capacity, Dr. Lein also expressed interest in the benefits to be derived from an Office of Research in Medical Education--especially in the continuing education field. Such was seen as particularly relevant in formulating programs in his relatively new venture.

When these aspirations were shared with representatives of the Public Health Service and its then Division of Community Affairs (Miss Cecilia C. Conrath)--particularly in view of the unique geographic, educational and historical facets of our situation--interest was expressed in possibly developing a collaborative program by contract. Over several months, the challenges of a contractual relationship were worked out. Of significant import is the fact that, simultaneously, details of the Regional Medical Program were also being worked out nationally and locally and, from the beginning, possibilities of overlap were recognized. Thus, by July, 1966, the contract was signed with nine specified objectives. It should be noted that the agreed-upon program also served as an initial step within the University of Washington School of Medicine in developing its Office of Research in Medical Education.

Recruitment problems precluded the appointment of a qualified Program Director for more than one year. Fortunately, in July, 1967, Dr. Charles W. Dohner agreed to join the faculty of the University of Washington both as Program Director and as Director of the Office of Research in Medical Education. While several activities had begun prior to his arrival, only subsequently did full pursuit of objectives begin.

ACKNOWLEDGMENTS

The development of a study such as this involved several individuals. We sought advice from and would express appreciation to many people, including Miss Cecilia C. Conrath, who assisted in drawing up the original contract; Dr. Alan S. Kaplan and Dr. John Escovitz for their encouragement; and two Project Officers, Mr. Norman E. Tucker and Mr. Norman E. Cronquist, for their valuable guidance as the contractual objectives were pursued.

Dr. LeVerne S. Collet and Mr. Ronald L. Hamberg, research assistants, provided invaluable assistance in areas of statistics and research design. Mr. Darrell Hull and Mr. Haigh Fox contributed of their time and expertise in the compilation and analysis of much of the data. Mrs. Lurie Pracht and Mrs. Velta Benson have been most patient, understanding, and cooperative in performing secretarial and other tasks essential in such a study.

Without the cooperation of the Washington State Medical Education and Research Foundation staff, the Washington/Alaska Regional Medical Program staff, the Division of Continuing Medical Education at the University of Washington, and a host of physicians who willingly participated in these studies, this study could not have been completed. To all of these individuals, we are extremely grateful.

W.O.R.
C.W.D.

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SECTION I

THE PROBLEM

This decade has seen continuing medical education along with undergraduate curriculum revision, admissions of minority students, arguments about relevance, the "mediums of the message" concept--these and other issues vie for notoriety on the medical education scene. Certainly, a host of factors have been responsible for the resultant "unrest"; a few seem particularly contributory in spurring on continuing medical education. Highlights include:

1. The scientific and technologic explosion. While biomedical historians can substantiate the point that no actual change in the rate of growth has occurred since the 1700's, in absolute numbers the products and developments have become virtually overwhelming. When one considers that 80 to 90 per cent of all the scientists that have ever lived are living today--and the number can be expected to double within 15 to 20 years--and that 80 to 90 per cent of today's drugs were unknown in 1940, the basis of the current dilemma becomes obvious.
2. The commitment to specialization in medicine. Starting at the turn of the century and reaching full steam immediately after World War II, specialization might be said to have run amuck. As a consequence, today's practitioner both expects and is expected to be far better informed in specific areas than was his predecessor of a generation ago.

3. The communication revolution. Obviously, with the advent of the radio, the telephone, television, and computers, information transmittal techniques have taken a quantum jump comparable to that initiated by the arrival of the printing press 300 years ago.
4. The transportation explosion. With the arrival of the modern automobile roadway network and jet airplanes, the potential for isolationism and reactionaries would seem to be lost.
5. A violent disruption of social philosophy. Now the public and its politicians as well as the profession would seem to subscribe to the theme that "health care is a right of the entire population." As a consequence, costs of health care are receiving increased scrutiny; cries to enhance the efficiency of the health care system echo throughout Congress--and over the United States. All make new and different demands as yesterday's health professional assumes a new image tomorrow.
6. The reincarnation of humanism. In the years immediately following World War II, science became deity. However, the past three years has seen a burgeoning of considerations of philosophy, ethics, moralities, etc., on campuses and among the population. The reaction has redirected, to some extent, the image of what constitutes acceptable continuing education endeavors in the eyes of many professionals.

7. Exploitation of the Hawthorne effect. Identified during World War II, the concept of inducing change for change's sake and its resultant improved behavior has gained wider and wider recognition. The import of this ingredient in the personal as well as professional life of the physician is being recognized with increased frequency.

The summation of these and other factors makes more than plausible the need for physicians to acquire additional knowledge, skills and attitudes after leaving the formal education years. Put differently, lifelong learning becomes critical.

In centuries gone by, the individual physician to a large extent not only was responsible for, but actually tended to, the conduct of his individual updating. Soon such a process was discovered not to be efficient enough to handle the load, but attention to alternatives awaited the Middle Ages. On the one hand, social organizations such as professional societies and, eventually, hospital staffs were formed to assist physicians with continued learning. On the other hand, communication technology (books, then journals) was employed to respond to the challenge. Today's new technologies offer still more possible responses; today's complex organizations would seem to do likewise. But burgeoning load and specialization of needs, as well as an ever-broadening concept of the physician's role, seem to negate the combined efforts of organizations and technology in catching up with the ultimate goal.

At the time this contract was being proposed, individual and organizational approaches to continuing medical education were mushrooming in the Pacific Northwest. Each physician and each organization seemed to be doing more and more--with virtually no regard for what was being done by others. While all agreed to the general need, neither individuals nor organizations had begun to undertake any critical analysis of the specifics involved. Nor had they capitalized on interdigitating and exploiting the existent communication technologies. The individuals concerned with the preparation of the contract and their sponsoring organizations agreed to the value of examining the issues carefully and recommending a continuing medical education plan which would be applicable to the Pacific Northwest. Thus, the jumping-off point was reached.

SCOPE OF WORK

1. Define the educational needs of practitioners in the Pacific Northwest.
2. Assess the resources available for meeting these needs.
3. Determine the types of educational programs which should be developed to meet the needs of the physicians.
4. Develop a system for evaluating the effectiveness of these programs.
5. Select two continuing education programs as the model for investigating why some physicians chose to participate in these programs and why some chose not to participate.
6. Develop and field test evaluation procedures of clinical communication systems, e.g., hospital patient discharge summaries sent to local medical doctors, telephone conversations, and/or correspondence between hospital and staff and patient referring physicians, etc. A major criterion of the evaluation shall be the effect upon patient care.
7. Evaluate the recently initiated seminar program conducted by representatives from the Schools of Medicine, Architecture, Education and Communication Arts, for those faculty members participating in continuing medical education programs. The purpose of this seminar is to improve understanding of the learning processes and to improve teaching skills.
8. Select two additional continuing education activities conducted by the School of Medicine for evaluation purposes. Activities to

be selected may include: relevance of medical student appraisal programs for practitioner education; relevance of techniques currently employed to assess needs of residency training programs; and methods to improve the quality and impact of medical journals.

9. Develop a comprehensive plan from the activities (1 through 5 above) for a continuing education center for physicians. This plan shall:
    a. Determine the functions to be carried out by the center.
    b. Set forth working procedures to be followed in establishing the center.
    c. Select specific areas of study and priorities of work to be undertaken by the center.
    d. Recommend a detailed scheduling of tasks to be undertaken for implementation of this plan.

Specific study areas to be examined in items 1 through 5 above were selected and agreed upon in advance by the Contractor and Project Officer.

Because a considerable length of time had elapsed between the initial date of this Contract and the employment of staff to pursue the contract objectives, adjustments needed to be made regarding specific details of each objective. A review of the objectives was made in collaboration with the Program Director and the Project Director. As a result of this review, it was decided that no further work need be done on Objective 7 since these activities were now history. Likewise, specific activities were agreed upon for each of the other objectives.

REPORT OUTLINE

An attempt has been made to describe the methods used and the problems encountered in the study. Section II contains a discussion of the method used to achieve Objectives 1 through 9. In addition to the methods, excerpts of some of the pertinent findings are included where it is deemed appropriate. A discussion of the problems encountered in pursuit of this contract and recommendations based on the findings from the various studies undertaken are to be found in Section III.

In the Appendix are more comprehensive records of studies undertaken in fulfillment of the various objectives. Included are papers which have been prepared under the aegis of this Contract, some of which have been published; others have been submitted for publication. The survey of Washington State physicians' attitudes toward continuing medical education is also included in the Appendix due to its relevance to the pursuit of the objectives of this Contract and the cooperative efforts of the Program Director, Washington/Alaska Regional Medical Program, and the Washington State Medical Association.

SECTION II

This section is a review of the methods followed in each of the specific phases (Objectives 1 through 9) of the study. Excerpts from some of the findings are included where such seems to be pertinent. More detailed reports can be found in the appendix and in previous quarterly progress reports.

OBJECTIVE 1: Define the educational needs of practitioners of the Pacific Northwest.

Two general approaches to this issue were employed: the first involved asking the physicians for their personal perceptions of needs and the second involved drawing on the existent data accumulated by the epidemiologists regarding the existence of health problems, accumulated by health educators in terms of professional learning needs and extrapolated from a review of recent scientific advances which had transpired subsequent to the graduation of the vast majority of the area's physicians.

Since the advent of continuing education activities (brief courses) with the University of Washington in the 1950's, opinions had been extracted from attendees regarding their appraisals of the courses offered and their suggestions of topics for additional courses. Summarization of these opinions provided some guidelines in the evolvement of a questionnaire to be completed by physicians in this area. Because of understandable restrictions on the use of mail questionnaires, it was deemed virtually impossible to conduct a questionnaire survey of the physicians under the terms of the contract within the desired time interval. Fortunately, however, the Washington State Medical Education and Research Foundation--a branch of the State Medical Association--had simultaneously decided to poll the State physicians regarding their perception of continuing education needs. Funds for this survey were provided by the Washington/Alaska Regional Medical Program and, as noted in their final report, they received consultative advice from the

Project Director as well as the Program Director. Our participation in this survey and use of subsequent data to contribute to our achievement of Objective 1 was approved by the then Project Officer, Miss Cecilia Conrath.

At the same time, the Project Director was fortunate in being invited to participate with a group of physicians in the South Seattle area as they discussed among themselves their "educational needs" and then evolved a program intended to respond to their stated needs. Interestingly, this pilot program proved so successful it is continued today and is now self-supporting.

In the spring of 1967, the School of Medicine and the Washington State Medical Association agreed that their annual faculty-community physicians' retreat ought be focused on the issues of continuing medical education. Chaired by the Project Director, the program was preceded by a sampling of the attendees' "continuing education behaviors" for the previous year. Admittedly a selected sample, it nevertheless offers postulated advantages of serving as a leadership cadre which conceivably may be emulated by the "masses." Somewhat surprisingly, five possible options available as "my biggest problem in continuing education" received almost equal attention. This group saw "learning to apply what is new," "finding out what is new," "corroborating what I think I know," "applying what I already know," and "discarding what is outmoded" all as important. A number of other findings were of interest, e.g., the favorable reception to "circuit-riding courses," the desire for television, the use and non-use of medical journals, etc.

One point is of particular significance. When asked to specify three "significant new medical advances" and the source from which they were obtained, the sample of 52 respondents cited virtually totally independent items of information. Thus, each individual seemed to see different items as being significant to him. Of 100 such items reviewed, 46 were purported to have been gathered from medical journals, 20 from hospital staff meetings, 27 from attendance at courses or national meetings, 4 from consultants and 1 each from "Audio Digest," a telephone conversation and a popular magazine. The individuality and diversity of topics cited and the variety of sources alluded to would appear to confirm some of the implications of the attached editorial, "Sock It To Us."

Also in the development of a "definition of need," the Regional Medical Program employed Mr. Robert Neth of the University of Kansas, Department of Continuing Education, to survey the state of Alaska with regard to continuing education needs for physicians. Results of this survey were made available to us; consequently, no repeat survey was undertaken, since we chose to avoid duplication of efforts.

With reference to data gleaned from the existent literature, it should be pointed out that in 1953 the "Washington Sickness Survey" was completed with appraisal of reasons for 73,188 patient visits to physicians throughout the state. At the time of its publication as a monograph as well as an abbreviated form in Northwest Medicine, this was a first of its kind. While no subsequent survey of total illness burden has been conducted in our total region, they were available from elsewhere. Simultaneously, the Regional Medical Program initiated a "patient origin study" intended to document the hospital illness burden as well as the geographic source of patients hospitalized throughout our region. While these data are not yet complete, no real reason exists to believe that the distribution of various illnesses is likely to be dramatically different in our region as compared to other regions in the United States--with the usual exceptions well-known to health officers, such as histoplasmosis, tuberculosis, etc.

Two brief reviews were conducted concerning the adequacy of treatment of two specific situations--one in the hospital, and one in the community. The underlying presumption was that any deficit treatment applied could conceivably be construed as pointing to educational need. The results were tabulated and reviewed in terms of adequacy.

As noted under Objective 4, a chart review was conducted in Yakima regarding the treatment of stroke under the fiscal auspices of the Regional Medical Program but with consultative direction from the Program Director. Simultaneously, a four-part television series was produced to outline and then depict conventional and acceptable approaches to management. The post-program review of charts ~~is~~ was being conducted--again under the aegis of the Regional Medical Program--this summer. [illegible] In part, the deficits uncovered initially did help to determine the educational program which followed.

We were also fortunate in being able to capitalize on the arrival of a "medical breakthrough" during the existence of the contract. In

May, 1968, RHO GAM--immune Rh globulin--became commercially available. Injected into Rh-negative mothers within 72 hours after their delivery of an Rh-positive offspring, this precludes the subsequent development of a hypersensitive state in the mother--and therefore excludes the development of problems with the next fetus. Since, in our county, all prenatal bloods are typed in a single station and all RHO GAM is distributed from the same single station, we were able to compute appropriate "use rates." At the end of the first three months of commercial availability, at least 88 per cent of the 167 patients at risk in the King County area did receive the appropriate treatment; another 8 per cent of patients are known to have declined to accept the treatment for either religious or economic reasons. Thus the information had been disseminated extremely rapidly and widely into the practicing community. In this instance, it would seem that no "need" existed for additional "education." We went further and conducted a telephone inquiry into a sample of 24 physicians seeking information as to their own sources of information and, what we considered to be more significant, their understanding of the "physiologic basis" involved. Interestingly, 22 out of 24 respondent physicians were judged as having remarkably complete understanding of the pathophysiology and immunopharmacology involved.

Finally, as noted under Objective 2, a Council of Community Coordinators has been mobilized to still further carry on the identification of individual and collective needs.

OBJECTIVE 2: Assess the resources available for meeting these needs.

Formal and informal methods were used to assess the resources available for meeting continuing educational needs. In approaching the assessment of resources within this state, answers to the following questions seemed pertinent.

1. To what degree do the various medical groups now provide continuing medical education programs?
2. Who are the key personnel throughout the state who have an interest, and who are actively involved, in supporting continuing medical education efforts?
3. What are the sources of financial support currently being used?
4. What, if any, instructional media are readily accessible for those sponsoring continuing medical education programs throughout the state?

In an attempt to find answers to the above questions, the Division of Continuing Medical Education at the University of Washington (in cooperation with the Office of Research in Medical Education) distributed questionnaires to four medical groups within the state that were potential resources. This questionnaire was sent to appropriate staff persons in the 126 hospitals, 27 medical societies, 51 learned societies, and to the 13 county health officers throughout the state. A follow-up letter was sent to those not responding on the first mailing. Table 1 shows the percentage of returns which range from 56 per cent for the county medical societies to 80 per cent for the learned societies.

Responses to four questions are presented in Table 2. It must be kept in mind that these findings are based on partial returns. Fifty-nine per cent of the hospitals have formal continuing medical education programs while only 8 per cent of the county health officers sponsor such programs. Clearly, the greatest resource among those responding in these four groups for continuing medical education is the hospital. However, 41 per cent of the hospitals responding did not have any organized continuing medical education programs. This leaves a vast resource that is only partially being utilized, to say nothing of the need for improving existing programs.

About half of the hospitals indicated that they have a staff member designated to coordinate continuing medical education programs. Very few of the other groups have such a person so designated. The fact that the hospitals do have a person in this position may account, in part, for the higher percentage of continuing medical education programs. The appointment of a staff member to assume this responsibility would seem to be imperative if organized continuing medical education programs are to become an integral part of the hospital's educational program. At the time of this inquiry, the hospitals and county health officers were fairly well-informed as to the opportunities under the Washington/Alaska Regional Medical Program; however, only about one-fourth of the county medical societies and learned societies were so informed.

The preponderance of continuing medical education programs sponsored by these four groups was directed toward the practicing physicians.

Very few of them were designed for allied health personnel. With the exception of 21 hospitals who indicated they either have more than one program per week or less than one per week for allied health personnel, continuing education programs for this group of health professionals are practically non-existent. If those who responded to this inquiry do actually represent the medical community's continuing education efforts for the allied health personnel, then one might well conclude that a great need does exist in this area. On the other hand, there may be other institutions or mechanisms whereby these health professionals can keep updated. This is a question for future investigations.

Table 4 presents the proportion of continuing medical education programs funded by dues, tuition, drug companies, or not funded at all. Thirty-one of the hospitals reported that over 75 per cent of their programs were not funded by any outside source. For the county medical societies, 25 reported that up to one-fourth of their programs were funded by the drug companies. Ten of the learned societies indicated that over 75 per cent of their programs were funded through dues.

The various educational media available for continuing medical education programs in these four organizations are reported in Table 5. Only those indicating they had formal continuing medical education programs were asked to respond to this question. The hospitals have by far the most equipment available, of which the most popular are slide projectors, movie projectors, and tape recorders. The county medical societies and the county health officers did not appear to have much equipment readily available to them. Future continuing medical education programs which require such media as television, movies, two-way radio, tape, etc., must be programmed with these needs in mind.

The comments of respondents from each of these four organizations are listed under item numbers 7, 8, and 10 which deal, respectively, with ideas about educational programs that are needed in the future, unique resources available in their area, and other comments or suggestions. (A copy of these comments is attached.)

In addition to this more formal approach to enumerating resources, informal discussions have gone on between the project staff of this Contract and interested persons in the Washington/Alaska Regional Medical Program, the Director of Continuing Medical Education at the University of Washington, the Executive Secretary of the Washington State Medical Education and Research Foundation, and the 20 Community Coordinators scattered throughout the state of Washington. During 1968, a pilot study was conducted in four cities using computer-assisted instruction as a resource for continuing medical education. Also, through the Project Director, Dr. William O. Robertson, cooperative efforts have been made in making use of two-way radio programs in conjunction with sources from the state of California available to the people in the state of Washington as well as the state of Alaska.

During this two-year contract period, we have seen a decided increase in the use of local television facilities as a media for supplying continuing medical education programs to physicians throughout the state of Washington. The resources of the University of Washington medical complex, the Washington State Medical Association, and the

Washington/Alaska Regional Medical Program are now available through a central organizational structure. Thus, individuals or local committees can request assistance from a single source in providing continuing educational programs to meet the needs of the local community. This type of a resource has hitherto been unavailable to the physicians in the Northwest area. In fact, each of the Community Coordinators has recently been supplied with an Audoscan projector, carousel program "O" slide projector, and Fairchild movie projector.

There are 23 community colleges within the state, most of which have an adult education program. We are beginning to use this resource more effectively. For example, regular continuing medical education courses developed for one community are now being conducted through the local community colleges' adult programs. The college supplies space and equipment as well as handles the administrative details. Increasingly, the community colleges will serve as a significant role in continuing medical education efforts.

Finally, three additional resources warrant recognition:

1. The region is served by a regional medical journal, "Northwest Medicine," which simultaneously serves as the official journal for three states--Washington, Oregon, and Idaho. (Alaska has its own state medical journal, "Alaska Medicine," edited by A. Van Hipple, M.D.) "Northwest Medicine" has Dr. Herbert Hartley--a recognized authority in the field of medical publications--as its editor; he is assisted by a region-wide Editorial Board of which the Project Director serves as Chairman. Periodic sampling surveys have been and are being conducted among readers regarding this particular vehicle; increasing efforts are being made both to increase its stature as a repository for prestige scientific articles and to increase its usefulness as a local-regional medical newspaper covering significant happenings on the medical, social, economic, educational, and psychological forefronts.
2. During the period of this contract, the Pacific Northwest Health Sciences Library was born. Under the sponsorship of the National Library of Medicine, this "facility" is, in fact, a regional cooperative arrangement among the various health sciences libraries in the Pacific Northwest, hospital libraries, medical society libraries, public libraries and enthusiastic librarians. Focusing on reprint services, bibliographic searches, and MEDLARS searches,

this organization is providing an invaluable service to the area's health professionals responding, for example, to all except 14 of the first 3200 requests generated to it in its initial three months of operation.

3. Also during this time interval, as was noted in the introduction, the Washington/Alaska Regional Medical Program (W/ARMP) came into being. One of its primary efforts has been in the field of continuing medical education. Working closely with the University and professional societies, both its Director, Dr. Donald Sparkman, and its staff have been extremely cooperative in sharing ideas and data with the Project Director and Program Director and have made available several of their projects as a "laboratory" for some of our investigations.

The W/ARMP financed the Washington State Medical Association's study of the continuing educational needs of its members. In part as an outgrowth of this endeavor, these two organizations joined with the University's Division of Continuing Medical Education in evolving a unique, area-wide organization. Leadership was provided by Dr. John N. Lein, Associate Dean for Continuing Education, Dr. Thomas Sheehy, Chairman of the Washington State Medical Association's Committee on Continuing Education, and Dr. Robert C. Davidson, Associate Director of the Regional Medical Program, in forming a "Community Coordinators' Educational Council." Invoking the following premises,

1. Continuing education is both an individual function--reading, talking, etc., and an organizational function--radio, movie, telephone, meetings, television, etc. Both are critical.
2. The individual M.D. should have an opportunity to put in ideas at all stages of continuing education as should their organizations--Washington State Medical Association, University of Washington, W/ARMP, etc.
3. A system of continuous continuing education functions is critical as are the continuity cogs in it--i.e., both people and organizations ought to participate for long enough intervals to be optimally effective,

these three organizations agreed as follows: a council ought to be created with broad representation to assure continuous individual input to participating organizations. At the same time, individuals may be invited from this council to participate in the output side at the local level. Thus the council comprises the "communication focal point" between the "individual" and "organizations" and among the organizations.

The main responsibility of the council is "To serve as a forum regarding continuing medical education with involvement of the School of Medicine, the Committee on Continuing Education of the Washington State Medical Association, the Washington State Medical Education and Research Foundation, and the Washington/Alaska Regional Medical Program as well as other individuals and organizations in the region.

Formally organized in September, 1968, and activated in December, this resource is rapidly becoming the integral network coordinating continuing medical educational activities throughout the state. Interestingly, it is likely to be emulated in the Alaska region shortly. (See also text relating to Objective 9.)

TABLE 1

RESPONDENTS OF A SURVEY OF CONTINUING MEDICAL EDUCATION
ACTIVITIES IN WASHINGTON, 1967

Organization	Number	Returned Questionnaires*	
		N	%
Hospitals	126	79	63%
County Medical Societies	27	15	56%
County Health Officers	33	24	73%
Learned Societies	51	41	80%

TABLE 2

CONTINUING MEDICAL EDUCATION PROGRAMS SPONSORED BY HOSPITALS, MEDICAL SOCIETIES, HEALTH OFFICERS, AND LEARNED SOCIETIES IN WASHINGTON, 1967

ITEM	Hospitals		County Med. Soc.		County Health Off.		Learned Soc.	
	Yes	No	Yes	No	Yes	No	Yes	No
1. Number of formal or organized continuing medical education programs.	47 59%	32 41%	5 33%	10 67%	2 8%	22 92%	21 45%	17 55%
2. Attempted an evaluation of continuing medical education programs.*	6 13%	39 82%	1 20%	4 80%	0 --	2 100%	4 19%	17 81%
3. Designated staff member to coordinate continuing medical education programs.**	39 49%	40 51%	4 27%	11 73%	2 8%	22 92%	14 34%	27 66%
4. Acquainted with opportunities under the Washington/Alaska Regional Medical Program.	59 74%	20 21%	4 27%	11 73%	14 61%	10 39%	10 23%	31 77%

* Per cent based on the number responding "Yes" in item 1.

** Per cent based on the number returning questionnaire.

TABLE 3

CONTINUING MEDICAL EDUCATION PROGRAMS FOR ALLIED HEALTH PERSONNEL SPONSORED BY HOSPITALS, COUNTY MEDICAL SOCIETIES, COUNTY HEALTH OFFICERS, AND LEARNED SOCIETIES IN WASHINGTON, 1967.*

Number	Hospitals	County Med. Society	County Health Officers	Learned Soc.
None	38	13	21	35
Very few	20	2	1	5
Less than one per week	15	0	1	1
More than one per week	6	0	1	-

* Allied health personnel defined as all health personnel except physicians and nurses.

TABLE 4

NUMBER OF RESPONDENTS THAT INDICATED PROPORTION OF CONTINUING MEDICAL EDUCATION PROGRAMS FUNDED BY DUES, TUITION AND DRUG COMPANIES FOR HOSPITALS, LEARNED SOCIETIES, AND COUNTY MEDICAL SOCIETIES IN WASHINGTON, 1967.

Source	Hospitals				County Medical Societies				Learned Societies			
	0-25%	26-50%	51-75%	76-100%	0-25%	26-50%	51-75%	76-100%	0-25%	26-50%	51-75%	76-100%
Dues	3	1	2	1	1	0	1	1	3	1	2	10
Tuition	2	0	0	0	0	0	0	0	1	0	0	1
Drug Company	4	1	0	0	25	1	0	0	3	2	1	1
Not Funded	5	0	0	31	1	0	0	1	1	0	1	1

TABLE 5

EDUCATIONAL MEDIA AVAILABLE FOR CONTINUING MEDICAL EDUCATION
IN HOSPITALS, COUNTY MEDICAL SOCIETIES, COUNTY HEALTH
OFFICERS, AND LEARNED SOCIETIES IN WASHINGTON, 1967.*

Media	Hospitals	County Med. Soc.	County Health Officers	Learned Soc.
Slide Projectors	42	5	4	12
Television	12	0	0	1
Movie	38	5	4	7
Fairchild Movie	10	0	0	1
Two-way Radio	2	0	0	0
Tape Recorder	31	0	0	0

* Only those indicating they had formal continuing medical education programs were asked to respond to this item.

COMMENTS

Hospitals

7. Educational Resources:

Specialists to lecture in remote areas on orthopedics, ENT, allergy.
More carefully selected movies, current films.
More informality--open exchange, small groups.
Review courses in all specialties--short, 2-3 days or less.
More organization locally.
General floor nursing technique review; coronary and intensive care nursing.
State-wide program of televised, movie, or Fairchild presentations for nurses, technicians.
New material and information on drugs, toxic reactions to new and old drugs.
Need more staff education--hard to get cooperation.
Mortality discussions monthly.
Wet clinics utilizing discussants abreast of latest research.

8. Resources:

Green River Valley postgraduate medical education; two courses yearly at Green River Community College, Highline Junior College.
Highly-talented medical population in Spokane.
Shrine Hospital in Spokane limited to children's orthopedics.
Occasional unusual cases.
Central Washington continuing education program, Regional Medical Program.
A central emergency room (Harborview).
Comprehensive Rehabilitation Center (Good Samaritan, Puyallup).
Heart Center, Coronary Care Unit.

10. Other comments or suggestions:

"Beefed up" programs would attract private physicians in area.
Organization (Pacific County) does not meet.
I would attend all surgical meetings and heart courses.
Films usually obtained from pharmaceutical firms.
Mt. Linton Hospital in Metalline Falls has no doctor.
Staff consists of only two M.D.'s.
Would like to know about meetings at other hospitals. We attend as often as possible.
Staff is so small that continuing education must be done on a personal basis instead of a hospital program.
Statewide integrated program provided jointly by the Regional Medical Program and University of Washington, and directed by you!
Current themes must be stressed.
Our monthly staff meetings invoke case discussions--frequently in-depth.

COMMENTS (continued)

County Medical Societies

7. Educational Programs:

   More about issues--less hard facts, social issues in medicine need exploring.
   Current therapeutics, refresher courses in subspecialties, practical demonstrations of methods of diagnosis. Stop lectures. Preceptorships for practicing physicians are great.
   Circuit rider program should not be discontinued.
   Current clinical, current research, federal and state legislation impact.
   Almost any topics welcome--traveling groups from medical centers could give concise information of general interest.
   Topics: USAD names of drugs; harmonal therophy of menarche; medical administration.

8. Resources:

   State government in Olympia.
   Educational television, taped lectures, less travel.
   Beautiful, conducive environment.
   Specialists in area could be asked to teach classes in specialty.

10. Other comments or suggestions:

    Members express appreciation of programs and the initiative that keeps them going.
    Kitsap County carrying out intensive course in coronary care.
    Courses given at University of Washington and Green River College have been valuable.
    We have no medical education program.
    Training for paramedical personnel is needed.

Learned Societies

7. Educational Programs:

   Education for medical technologists.
   More 2-day meetings concentrating on one difficult area.
   Television program to show the value of therapy to multiple sclerosis patients. So far, unable to interest stations. Also, center for multiple sclerosis.
   Training for emergencies.
   Blood component therapy, proper utilization of blood and blood components.
   Lectures, slides, and movies relevant to ophthalmology.
   Videotape.
   Better variety of more mundane topics of which D_x and R_x are relatively simple.

COMMENTS (continued)

8. Resources:

Pathologists could be tapped for general physician education more often.
American College of Surgeons has large film library.
The University.
State, Red Cross blood banks enthusiastic about serving.
Cadre of subspecialists practicing mainly but on clinical faculty.
Largest lab in United States for blood compatibility, nearly largest Rh lab, third largest blood bank. Only blood bank with completely centralized community.

10. Other comments or suggestions:

Would it be helpful for state medical societies to have lists of pathologists who are "experts" so as to spread teaching load?
General meetings no longer do adequate job.
2-3 day meetings are best for keeping abreast of what is new.
The disproportionate time spent on general practice in view of the decreasing number is not doing the job.
Travelling teams educate at "grass roots" level.

County Health Officers

7. Educational Programs:

Any new knowledge from Seattle; labs need closed circuit television; specialized teaching personnel.
Sex education, alcoholism, emphysema, recognition of orthopedic problem.
Our society could benefit from any program.
Venereal disease, tuberculosis, glue sniffing, hallucinogenic drugs, narcotics, also better utilization of local allied services--child guidance center, crippled children's clinics, etc.
Office preventive medicine, new medical hazards (contamination, drugs, cosmetics).
Part-time postgraduate training for Public Health Nurses.
Family planning, lab methods in CD.

8. Resources:

Specialists in medical and paramedical state departments (Health, Welfare, FDA).
Orthopedist in crippled children's clinic.
Fine television broadcast on Channel 47 (educational channel, Yakima) once a week at 7:00 a.m.
Facilities of Health Department (lab, etc.); facilities of Clark College.

COMMENTS (continued)

10. Other comments and suggestions:

Keep it up!

Our society is alarmingly apathetic about programs.

There is a definite lack of knowledge among physicians coming to public health about that, laws regulating public health, and the valuable resources through public health. Local education seems to be helping some.

Great difficulty finding speakers on sex education, VD, drug abuse, etc., which are vitally important.

With so few doctors in the county, a program is much too expensive to be local.

OBJECTIVE 3: Determine the types of educational programs which should be developed to meet the needs of the physicians.

During the course of this Contract, a significant change has taken place in both the philosophy and method of developing educational programs for the practicing physicians. In broad terms, the criteria for selecting and developing programs are now being based more on the expressed needs and requests of local physicians rather than upon the desires of members of the medical center or academic community. In point of fact, many of the programs offered under the guise of continuing education have been up to now really exercises in "soft sell"--and occasionally "hard sell"--persuasion of the attendee of his ignorance or incompetence and of the speaker's unique expertise. Put differently, they have often represented the promotional platform of new specialties establishing their place in the sun or medical centers recruiting patients.

Partly based upon the results of some of the course evaluations we have done, such as "Urology for Non-Urologists," the content of some of the programs has shifted from concentrating upon evaluation of limited scope to that of content evaluation, which is seen by participating physicians as review, reinforcement, and the updating of knowledge. Many courses are making more use of small groups for discussion and individualized instruction; there is less emphasis on the large continuing medical education short courses; and there is an increasing use of the problem-solving technique of instruction rather than a series of short lectures, one after another, during a two-day course. An example of a course incorporating a variety of methods is the "Hemorrhage and Thrombosis" course, where four different teaching methods were used--lecture, problem solving, small group demonstrations, and panel discussions. In essence, areas of "wants" and "needs" are increasingly being converted to educational programs packaged in a variety of forms permitting the local physician to select his own method of learning.

Several of the recent programs have been planned by non-University individuals and local committees. For example, a cardiologist from the Central Washington area, Dr. Richard Twiss, examined hospital records in Yakima hospitals and determined that there was a need for upgrading the physicians' abilities to interpret ECG's, particularly as they are related to arrhythmias. There was also evidence of missed diagnosis and inadequate treatment of arrhythmias. Resulting from this determined need, television programs were specifically designed, visiting cardiologists presented seminars, and handbooks were printed to meet the needs of this area. Subsequently, Dr. Twiss has taken it upon himself to train physicians in outlying communities. Several physicians are now coming into Dr. Twiss' hospital via preceptorship-type programs to update themselves. This activity is a product of identification of specific need within a community by a member of that community.

Committees comprised of other physicians from the Central Washington area have identified needs in the area of heart, cancer, and stroke, and have requested programs designed to meet these specific needs as they perceive them. A series of three programs in each of these areas have been videotaped, followed by a "wrap-up" session with the lecturers for discussion of specific areas not well understood, or for extension of the content material. These programs are now being made available to physicians throughout the entire state. As a result, continuing medical education activity has been stimulated where none existed before because a small community tried to meet its own needs.

At Green River Community College, located a few miles south of the Seattle medical complex, a group of local physicians spurred on by Dr. William Shaw continues to attempt to identify their continuing medical education needs. The contents of programs and topics are being decided upon by local physicians. This group, in turn, then requests personnel from the University of Washington and/or from private practice to develop programs that would meet the particular expressed needs. The community college is being used as a resource in the Green River area. All of the courses and seminars are channeled through the community college; they are held in community college facilities and, to a large extent, are administered by the adult education division of the community college. In addition, the college reminds attendees of each of the sessions by telephone to his wife--it uses the same technique regarding educational television programs--and conducts simple questionnaire surveys of attendees after each course. These studies were instigated by the Project Director of this Contract and feedback of comments to course organizers and individual speakers has proven particularly beneficial to those planning subsequent courses. Moreover, review of the outcomes with the attendees themselves has helped to sharpen the definitions of their own objectives. Similar efforts are getting under way and will soon be initiated in Tacoma, Washington.

A pilot preceptorship program was initiated about two years ago. This program involves the participation of a local physician in a one-week individualized program with a specialist in the area of the local physician's expressed needs in the Seattle medical complex. The physician identifies the areas of weakness or the areas of study that he feels essential to improving his practice; he then is matched with a specialist in a hospital setting that can best meet the needs that he has expressed. Evidence of the popularity of this program is that, presently, there are more than 1,200 applications from physicians throughout the state to participate in a preceptorship program such as this. Plans are in progress now to use hospitals in Seattle, Spokane, Yakima, Wenatchee, and Tacoma in an effort to provide learning environments for those physicians who have indicated a desire to participate in such a preceptorship program.

Participants in the traditional continuing medical education short courses sponsored by the University of Washington are consistently asked to indicate what their needs are and what kinds of programs they feel would be essential to keep them updated. The responses are then analyzed and an attempt is made to develop programs to meet the expressed needs. The following are examples of specific programs which can be cited that were developed directly as a result of the participants' expressed needs, examination of hospital records, and requests from local committees:

1. The Bedside Diagnosis of Stroke.
2. Ancillary Methods in Diagnosis of Stroke.
3. Recognition and Treatment of Arrhythmias.
4. What's New in Endocrinology?
5. A Review of Gastroenterology--Medical and Surgery.
6. Is It Neurological, Neurosurgical, or Psychiatric?
7. Preceptorship programs related to arrhythmias.
8. Animal laboratory experiences are now available three times a year, for 15 physicians to gain skill inserting pacemakers on a one-to-one basis with a cardiologist.

In summary, a greater effort is being put forth to organize continuing medical education programs around the expressed and/or determined needs of the practicing physician. Several such courses have been cited. The importance of incorporating a variety of educational methods instead of a series of consecutive lectures seems to be catching on. As needs of the practicing physicians continue to be more specifically defined, objectives for continuing medical education programs can be more adequately developed resulting in programs that can be designed to achieve the objectives.

OBJECTIVE 4: To develop a system for evaluating the effectiveness of these programs.

A great deal has been written and much more said about the need for evaluation of continuing medical education programs, yet the evidence of effectiveness of continuing medical education on medical practice continues to be elusive.

As we have worked on this phase of the contract for the past several months, researched the literature, and talked with other people concerned about this aspect of continuing medical education, we have come to accept the following conceptual framework for evaluation.

Six premises upon which to build a system of evaluation are:

1. The purpose of evaluation is to judge decision alternatives.
2. To apply criteria to decision alternatives, it is necessary to have relevant information.
3. Different studies require different evaluation strategies.
4. Different decision questions require different evaluation designs.
5. While the substance of different evaluation designs varies, a single set of generalizable steps can be followed in the design of any sound evaluation.
6. Since evaluation studies should answer decision questions, evaluation designs should satisfy the criteria of practical utility as well as criteria of scientific adequacy.

Based upon these premises, we might define evaluation as "the process of defining, obtaining, and using information to judge alternatives" (Stufflebeam, 1969). This definition indicates that evaluation is a process. The process is a continuing one and may be represented geometrically as a helix, assuming that the defining and measuring of objectives and criteria go on continually in a sequential manner with constant review and revision of each step. This approach involves defining information to be collected, obtaining this information, and utilizing the obtained information. The information gathered is used to assist in making decisions among available alternatives. The scientific criteria must include internal validity, external validity, and reliability. In addition to the scientific criteria, the evaluative information should meet utility criteria, such as relevance, significance, scope, credibility, timeliness, pervasiveness, and efficiency.

With this conceptualization of evaluation, we have proceeded in the fulfillment of this contract to approach the evaluation of continuing medical education programs in such a way that the criteria for good evaluative information are met. Since we are working in a very real world, obviously we were not always able to satisfy these criteria. The approach that we have taken on the various projects is to work with the project director of the sponsor of the course in a team effort. It is assumed this approach will yield more significant results than the approach of having an "outside evaluator" evaluate a program for the individuals responsible for it.

Examples of the approaches we have used in building evaluation designs for continuing medical education programs are included herein. These examples include the Central Washington Project, the Coronary Care Unit Project, "Hemorrhage and Thrombosis," and a pilot time-and-motion study. The approach used involves several steps. First, the evaluators met with those responsible for the course or the project.

During the initial stages, the objectives for the program were reviewed and, in most cases, revised. After an agreement had been made regarding what the objectives of the program would be, an outline was presented for the method by which one could determine whether or not each objective was achieved. Essentially, this was comprised of a statement of the objective, a list of things that needed to be considered, such as hypotheses that might be tested, definitions of concepts and terms involved in the objective, needed sample size, statistical procedures, how the data might be interpreted, and recommended evaluation instruments, either instruments readily available or instruments that would be constructed for this particular project. Secondly, alternative research designs were presented. Each design was discussed in terms of its scientific merit, sampling procedure, data-collecting procedures and general administration procedures. The interpretation of results one would get from each design was discussed in terms of the degree to which generalizations could be made from this study to a broader population. Accompanying the discussion on research design was our recommendation regarding which one to follow.

Those responsible for the programs would react to the various designs presented and a final decision was made as to which approach would be implemented for determining the achievement of individual objectives. Needless to say, our recommendations were not always accepted; however, on many occasions, they were. Also, the environment in which the programs were to be presented sometimes inhibited pursuing the design having the most scientific merit. Examples illustrating the aforementioned procedures are found on the pages immediately following.

Example 1

PROPOSED OUTLINE FOR CENTRAL WASHINGTON STROKE PROGRAM

Objective	Evaluation Suggestions
1. To provide opportunities for teaching and learning which will improve care of victims of heart, cancer, stroke, and related diseases.	None. Objective presumed met with presentation of program.
2. To improve communication between the Seattle academic complex and Yakima which will augment continuing education.	By having Drs. Fryer and Titus keep a record of informational communications from Yakima area starting now and continuing through Dec. 31, 1968. The records will be kept on forms provided by Dr. Dohner (see attached). A follow-up questionnaire will be devised which will include which programs were watched as a question and also yield information as to how many physicians watched.
3. To improve communication between Yakima and its surrounding communities in ways which will augment continuing education.	Dr. Gustafson and any others in Yakima he feels appropriate would keep records starting as soon as forms are sent to them and continuing through Dec. 31, 1968, in the manner above.
4. Stimulate health practitioners to identify their own educational needs.	Perhaps this can be met in part with a question on the post-program follow-up questionnaire used for objective 3. (To be sent out and collected by Dr. Gustafson.)
5. To investigate records of whatever pertinent data are available to substantiate needs and/or determine others.	None. Presumed done by RMP and prior questionnaire sent out before the program began.
6. To design personnel and facilities to gain maximum profit from hospital visits by Seattle academic personnel.	None. Met with wrap-up sessions.

7. To design evaluation instruments which will reveal practitioners' progress toward goals.	A. A pre- and post-test covering telelecture content administered to a sample of physicians in the Yakima area and surrounding communities. This requires: 1. A list of potential viewers. 2. A sample of physicians from a similar community for instrument reliability. B. Administering a Semantic Differential attitude measure (see attached) along with the pre- and post-test to measure attitude toward the telelectures and the program generally. C. An examination of hospital records covering a period before and after the program using criteria established by Drs. Fryer and Titus in order to see if any behavioral change in practice takes place following the program. Possibly using med. students to gather this data and also to conduct short interviews with Drs. who watched the program for opinions. (A pilot study would begin this summer as soon as personnel and record availability are obtained.) The data would be examined the following summer depending on the results of the pilot study.
8. To re-create habits of self-instruction.	?
9. To provide latest advances in the diagnosis, treatment, and rehabilitation to victims of heart, cancer, and stroke in Central Washington area.	None. Presumed met with lectures.

METHODS OF EVALUATION

1. Utilize data relating to:	
a. patient care	record study
b. practitioner participation	follow-up questionnaire
c. changes in practice patterns	record study
2. Periodic examinations of:	
a. hospital records	record study
b. disease mortality-morbidity data	?
3. Demand for self-instructional equipment	?
4. Degree of viewer response.	follow-up questionnaire
5. Participation in summary discussions.	head count?

LIST OF DETAILS

1. Names of physicians who will likely watch the program.
2. Use of the Semantic Differential.
3. Sample for pre-testing of knowledge gain instrument.
4. Funds to support medical students (wages and per diem) for record study.
5. Approval of instruments and procedures.

PROPOSED EVALUATION MEASURES FOR YAKIMA PROJECT

I. ATTITUDE CHANGE MEASURE

Considerations:

The Semantic Differential is a device for measuring attitudes toward a construct and also the relationships of the construct concepts to each other. The most commonly used scales define the construct selected on the dimensions: evaluative (good-bad), potency (weak-strong), and activity (active-passive).

Thus a concept such as "television" could be seen as strong, active, and potent or as various degrees of these factors. It could also be seen in relationship (i.e., where it stands with all other concepts being measured). The overall evaluation of the concepts defines an attitude toward the construct (here, the Yakima Project).

The purpose of the Differential is for attitude measurement and it may be used to test attitude hypotheses. It is suggested that one way of measuring the effectiveness of a continuing medical education program would be to measure attitudes toward relevant concepts of that program before and after the program.

The following are examples of what are felt to be some relevant concepts to continuing medical education attitude, specifically for the Yakima Project: televised learning, television, lecture, televised lecture, review material, research material, continuing medical education, practical material.

The research hypothesis is that there will be a significant change of physician attitude during the course of study: specifically, that "televised lecture." "televised learning." and "continuing medical education" will come to be seen as more active, stronger, and better.

We feel that it is also important to see whether participants' attitudes toward "television," "lecture," "review material," "research material, " and "practical material" change as a result of these programs. Other studies, such as "Urology for Non-Urologists," have shown disagreement about these concepts and continuing medical education. The data would provide guidelines for the planning of future programs by serving to 1) identify

DIRECTIONS

Below is a term which can be rated by placing an X in the space which best represents your feeling about that term for various pairs of words.

House

very   very

good ______:______:______:______:______:______:______ bad

active ______:______:______:______:______:______:______ passive

weak ______:______:______:______:______:______:______ strong

First, you would decide whether you feel HOUSE seems "good" or "bad." If you feel HOUSE was very "bad," you would place an X in that space. You may place an X wherever you feel it should be to represent your feelings about the term HOUSE.

While this may seem difficult, it has been shown that such ratings of terms are possible and reliable if done rapidly, without dwelling on each scale. It is then possible to get a picture of how each term is seen with regard to the various pairs of words.

On the following pages are several terms. Please work rapidly and mark each term on every scale. Do not omit any terms or ratings.

Television is:

very   very

light ___:___:___:___:___:___:___ heavy

bad ___:___:___:___:___:___:___ good

large ___:___:___:___:___:___:___ small

clean ___:___:___:___:___:___:___ dirty

fast ___:___:___:___:___:___:___ slow

weak ___:___:___:___:___:___:___ strong

ugly ___:___:___:___:___:___:___ beautiful

passive ___:___:___:___:___:___:___ active

sharp ___:___:___:___:___:___:___ dull

Lectures are:

very   very

fast ______ : ______ : ______ : ______ : ______ : ______ : ______ slow

ugly ______ : ______ : ______ : ______ : ______ : ______ : ______ beautiful

large ______ : ______ : ______ : ______ : ______ : ______ : ______ small

active ______ : ______ : ______ : ______ : ______ : ______ : ______ passive

strong ______ : ______ : ______ : ______ : ______ : ______ : ______ weak

dull ______ : ______ : ______ : ______ : ______ : ______ : ______ sharp

dirty ______ : ______ : ______ : ______ : ______ : ______ : ______ clean

heavy ______ : ______ : ______ : ______ : ______ : ______ : ______ light

good ______ : ______ : ______ : ______ : ______ : ______ : ______ bad

Televised lectures are:

very   very

fast ______:______:______:______:______:______:______ slow

passive ______:______:______:______:______:______:______ active

heavy ______:______:______:______:______:______:______ light

small ______:______:______:______:______:______:______ large

dull ______:______:______:______:______:______:______ sharp

good ______:______:______:______:______:______:______ bad

ugly ______:______:______:______:______:______:______ beautiful

strong ______:______:______:______:______:______:______ weak

clean ______:______:______:______:______:______:______ dirty the desires of the audience, 2) specify the composition of the audience with regard to their attitude toward the purposes and the presentation of the program.

The Semantic Differential is thus a flexible and demonstrably reliable device for measuring attitudes. It is felt that attitudes are one indication of the effectiveness of a program such as the Yakima Project. The scale is completed rapidly (approximately 15 minutes) and the data can be dealt with anonymously.

II. KNOWLEDGE GAIN MEASURE

Considerations:

1. There must be a base rate group which does not attend which is tested before and after the sessions. If necessary, the comparison could be made on two random groups from the population of non-participating physicians.

2. There must be a pre- and post-test demonstrably equivalent; or the same test may be used if test-retest reliability is shown to be high.

3. If the same group can be tested before and after a particular session, or series if possible, then the data can be evaluated in terms of net gain.

4. Ideally, the groups would be stratified samples; however, this seems to present too many problems of data gathering.

5. All designs are for one session or one series; they would have to be repeated for each area, e.g., cancer, stroke, heart, if information is desired for each.

6. Preliminary test construction should be done on two groups separate from those who attend and those who do not attend samples.

7. Whether the physician watched at home or at a hospital, what type of practice he engages in, age, date of graduation, and postgraduate study should be considered in evaluation. Thus, a third design would be analysis of covariance or randomized blocks.

8. The period after the sessions before post-testing determines whether we are measuring immediate recall or permanent

knowledge gain. Thus, a decision must be made for when post-testing will take place.

DESIGN 1:

A random sample of the non-participating physicians for any given session, or series if possible, is to be administered test a. A random sample of the participating physicians for the same session or topic will also receive test a prior to the session. After each session, a random sample of participating physicians, as well as a sample of non-participating physicians, will take test b. (Note: The same design would apply for a test retest using the same instrument.)

DESIGN 2:

A random sample of non-participating physicians for a given session (or series) will receive test a. A random sample of participating physicians would also receive test a. Both groups would be tested at the end of the session or topic.

DESIGN 3:

Data on age, postgraduate work, viewing conditions, practice, and date of graduation would be gathered for all physicians participating in the study. Pre- and post-tests would be administered to those physicians attending a given session (or series). Also, a control group would be measured and demographic data gathered. A randomized block design would be used to evaluate the results.

Design 3 is the most preferable, design 2 is next preferred, and design 1 is least preferred from a statistically defensible viewpoint.

III. CHANGE IN PRACTICE MEASURE

Considerations:

1. Cooperation for access to records would be necessary from the hospitals serving the central area.
2. Criteria for desired diagnostic tests and treatments would have to be established.
3. It would be necessary to know which doctors attended each lecture.

4. A staff would be necessary to search the records.

5. No knowledge testing would be necessary to evaluate the effectiveness of the project.

DESIGN:

Hospital records would be examined for a period prior to the series for patients whose final diagnosis for the admitting symptoms is known. Histories, tests, and treatments ordered would be recorded. The results could be assigned scores based on criteria established by the lecturers.

In order to derive criteria for assigning scores, it would be necessary to meet with the lecturer(s) for each program. Minimally acceptable practice and desired practice levels as well as the relative importance (weights) of the various parts (i.e., history, treatment, and tests, etc.) would have to be ascertained.

The first examination of the hospital records could begin as soon as the final program had been written and the criteria established.

At a determined period after the series, the records would again be examined using the same criteria. The scores before the series and after the series would then be compared. Higher scores following the series would indicate practice changes.

The relationship between number of lectures attended and practice change could be examined as well as other relationships determined in advance provided the data are accessible.

IV. COMMUNICATION EVALUATION

Objectives 2 and 3 for the Yakima Project are to improve communication between Seattle and Yakima and Yakima and its surrounding communities.

We feel that four types of measurable communication are:

1. telephone.
2. letters.
3. personal visits.
4. referral letters.

Increases in frequency of these communication channels could be interpreted as being related to the Yakima Project if a base rate count were established before the series for comparative purposes.

Method:

1. Select a sample of physicians in the Seattle and Yakima areas who are referral targets. A sample would be selected for each series and would include the series lecturer(s).

2. If cooperation can be obtained, the secretaries would record (count) the number of contacts for each of the four above methods of communication. This count would start immediately and continue for three months following the particular series.

3. Recording forms and instructions will be supplied to the secretaries by the Office of Research in Medical Education.

Example 2

SUB-REGIONAL CORONARY CARE EDUCATIONAL PROJECT

The primary purpose of this project is to support and coordinate Sub-regional Coronary Care Nurse Education Programs to prepare approximately 873 nurses per year over the next two years in the Washington-Alaska region for service in Coronary Care Units.

A standardized curriculum will provide a 120-hour course, including 30 hours of physician and 90 hours of nurse instructor time. It will include a mixture of didactic and clinical learning experiences. The project will be accomplished with involvement of community colleges, state universities, local physician and nurse groups, in-service directors of local hospitals, and the Washington and Alaska State Heart Associations.

Through the Washington/Alaska Regional Medical Program Coronary Care Unit Coordination Project, feedback from the sub-regions has made it increasingly clear that educational programs of excellence must move to the sub-regions--the sub-regions cannot go to centralized training centers. This project is designed to provide a beginning framework for development and improvement of cooperative networks within and between sub-regional communities, their health care professionals, and institutions in the development of ongoing self-supporting, continuing nursing education.

The evaluation design which has been prepared for this project by our office is as follows:

CORONARY CARE UNIT EVALUATION SCHEME

I. Problem:

There exists, at present, in the state of Washington a need to train Coronary Care Unit (CCU) nurses on a large scale of operation which is both locally operated, yet centrally monitored, and partially controlled for quality.

In order to maintain a desired level of quality, it is necessary to evaluate the process and product of each program using criteria established centrally by the CCU Project staff in conjunction with the Office of Research in Medical Education.

Evaluation, in turn, must meet statistical criteria, such as defensible sampling procedures, reliability and validity--external and internal--of measures, etc. In addition, these questions must be investigated through basic research.

In this project, in addition to evaluation, there are questions about the effect of confidence in responses to knowledge questions which we feel are of concern for evaluating the success of individuals in this project as well as for measuring "certainty" of knowledge in any testing situation. Also, we feel that "interest" or attraction to the situation (CCU nursing) is a variable that may affect the individual outcomes (and, conceivably, some local program outcomes). Therefore, these questions are being dealt with using basic research designs within the overall evaluation procedure.

II. Proposal:

It is suggested that the evaluation of the CCU Project will include measures of knowledge, skill, attitude and confidence in knowledge, and that necessary levels of attainment in each of these four areas be determined in advance of the onset of the programs.

Assumptions:

A. It is assumed that there are minimum levels of knowledge and skill necessary to 1) be of essential use in a CCU and 2) avoid preventable harm to patients. These two clauses are components of post-program effectiveness. Only essential knowledge and skill will be included in determining these minimum levels.

B. It is assumed that tendencies to hold certain positive attitudes favorable to CCU work are more desirable than negative tendencies.

C. It is assumed that confidence is an atribute of post-program effectiveness (as defined in Assumption A).

III. Hypotheses:

A. It is hypothesized that attitude and knowledge and skill will correlate positively, i.e., that those persons with more positive attitudes will do better on essential and non-essential knowledge and skill measures than will equally otherwise competent persons as measured by pre-program knowledge levels.

B. It is hypothesized that nurses who are rated as superior in effectiveness by physician directors of the unit six months post-program will have more measured confidence than those nurses who are otherwise equally competent but who are rated adequate or inferior.

IV. Delimitations:

A. Because this program is using intact groups starting and finishing their programs at various times, evaluation will not be generalizable to other groups.

B. The evaluation is not going to test for "treatment," but rather to see if the specified objectives were realized, i.e., do the CCU program products have desired knowledge, skill, and attitude?

C. The evaluation is not going to test instructors per se, but rather to see if any programs are more effective (have higher success rates) than others and to suggest hypotheses as to why this is.

D. This evaluation does not include the impact on patient care.

V. Instruments:

A. Knowledge will be measured using multiple-choice and recall items. Each knowledge item will be accompanied by an indicator of confidence in response from 1 (confident) to 5 (I don't know). Both essential knowledge and non-essential knowledge will be identified and measured.

B. Skill will be measured using a simulated problem in a CCU mock-up. Specific operations will be "checked off" as done or not done--non-essential and essential skills will be identified and measured. A patient management measure might also be considered.

C. Attitude will be measured using either a semantic differential (see attached example) or Likert (five-point) scales or some other method to be determined before the start of the programs.

D. "Confidence" will be measured by a five-point scale ranging from "confident" to "I don't know," and weighted from +4 to -4, i.e., a person who says he is "confident" and scores incorrectly receives a -4. Such a procedure will not confound the knowledge measures because the answers remain the subjects' best guess in any event.

VI. Procedure:

A. The knowledge, confidence, and skill tests will be developed and pre-tested on a group of nurses not involved in the project otherwise. The final instruments (pre- and post-) will be mailed out to each program director with instructions for administration and return, or will be administered by a field coordinator or another designated individual.

B. The attitudinal measure will be developed and mailed out along with the other instruments. It will be given pre- and post-program.

C. The skill measure(s) will be decided on and mailed out at the end of the program in order to avoid contamination, i.e., teaching of the instructor only for the final skill measure, which is only a sample (hopefully, a good sample) of behavior.

D. Administration of the skill test may be done by one of the field coordinators or another designated person in order to assure reliability.

E. A random selection of data from all of the programs will be made in order to test the hypotheses.

VII. Design:

Figure 1 below shows the 2x2 factorial design for hypothesis A.

Attitude

		+	-
pre-knowledge	high	A_1B_1	A_1B_2
	low	A_2B_1	A_2B_2

Figure 1

Figure 2 below shows the 2x2 factorial design for hypothesis B.

		Rating	
		superior	other
pre-confidence	high	A_1B_1	A_1B_2
	low	A_2B_1	A_2B_2

Figure 2

Example 3

EVALUATION REPORTS FROM THE COURSE, "HEMORRHAGE AND THROMBOSIS"

A different evaluation design was initiated for evaluating the course, "Hemorrhage and Thrombosis." We are quite optimistic about the feedback information that this method made available. The approach made use of an evaluation team of observers from various academic areas which was comprised of two participating physicians, two technicians, two participating faculty members, and two education specialists, not associated with the medical school.

Each team member was given a rather unstructured outline consisting of a few questions around which he could record his impression of each session during the two days. After the program, each evaluator submitted a written report of his observations, including recommendations for improving the course. A week after the course, a meeting was held with the chairman of the program at which time each team member was given opportunity to share observations about what was done well and what needed improvement. The chairman also queried each participant by mail in an attempt to ascertain his reaction to the program.

The following reports are examples of the observations made by four of the eight team members:

EVALUATION REPORT ON THE COURSE

"HEMORRHAGE AND THROMBOSIS"

by John Driscoll, Ph.D.

Part I: Effectiveness of course

A lay viewpoint on effectiveness is naturally quite limited. If one attempts to judge "effectiveness" of planning, organization and presentation, then I would say the course rates high. Presentations demonstrated careful relationship to preceeding topics. There were ineffective spots; for example, the first presentation--obviously a clearly thought-out review of coagulation--was too long and could certainly have been streamlined for such a short course. The panel on "Treatment" (11:20 second day) was useful and looked forward to by the audience, but was reduced in effectiveness by an over-due intermission and by following another panel. At other points in the course, two or three speeches were lumped together and seemed a little tedious for the audience.

Part II: Appropriateness of teaching methods for adult education

There are characteristics special to medical education which are difficult for the non-medical person to assess, but the following generalities about the course methods are offered:

A. Projected teaching aids:

1. The slides tended toward dullness of presentation due to lack of contrast in the first set and repetition in the two sets following.

2. The slide showings were almost ruined by the podium light. A directional light for the podium which does not spill onto the screen would be very inexpensive in comparison to its usefulness in improving presentations.

3. The slides using colored letters on blue backgrounds were the most effective, but even these badly needed some variety. I believe there is a tendency to use the many advantages of the projected image largely for words to reinforce words uttered by the speaker--this is underestimating two great advantages of slide showings, i.e., use for reinforcement via symbolic and pictorial representation of abstractions, and for stimulation of interest. These advantages should not be by-passed for the sake of traditional limitation to listings and photomicrographs.

B. Speaker presentations:

1. There was a certain amount of inconsistency in these due to some speakers presenting too much material in a short time and thus hurrying over some points while a few presentations were overly long. Line graphs in the talk on prophylactic uses of anti-coagulants, for example, tended to be tedious to look at and to lengthen the talk.

2. The presentations would seem to be more meaningful if more use of statistical evidence were incorporated.

III. Recommendations for improving such a continuing education course:

A. General plan

1. Streamline and edit material to fit into a fast-moving, cogent, one-day learning experience.

2. Plan learning facility so as to avoid large auditoriums for small groups.

B. Teaching techniques:

1. Improve slide presentations by employing more photographs and symbols. Avoid deep research-type graph presentations such as that on megakaryocytes.

2. Whenever talking about changes in blood biochemistry which are visible through motion, use the motion pictures available--even a brief film-clip is better than a long set of

slides if and when motion is inherent in the changes being taught. Do not, either, underestimate the interest-stimulation advantages of film clips.

3. Use more clinical presentations, such as the panel on clotting and the case problems discussions of Friday afternoon. (In fact, using the case problem technique earlier could make the learning experience far more involving.)

4. Pay more attention to pacing--less speech after speech, more visualization, more bring-back-in-brief to the large groups significant points from demonstrations and small group discussions, less overlap quicker, edited reviews and talks.

5. Consider variety possible by bringing in a pharmaceutical person, as you did with bringing surgeons.

6. Recapitulate briefly and make some quick observations of tomorrow's trends and research.

EVALUATION REPORT ON THE COURSE

"HEMORRHAGE AND THROMBOSIS"

by William D. Rearick, M.A.

I. Ideally, what should a short course such as this attempt to do?

Confront the practitioner with data, procedures, equipment he might not now be aware of, and provide him sufficient opportunity to gain some competence in its use. This means that a highly pragmatic orientation is necessary.

II. To what degree did this course approach the ideal mentioned in number 1?

The presentation of problem cases, the case study small group discussions, and the panels on diagnosis and treatment seemed to meet this standard in that order, although it might be a toss-up between the first- and second- named items. Both brought out the most dynamic participation of those in the course.

However, in conversation with two of the participants after the last session (a technique for evaluation I would recommend for future use), both doctors to whom I spoke praised the entire two days. They labeled the case studies at the top, the problem cases next. Both did recognize the necessity for the other data-presenting lectures with appreciation. They expressed praise for the authorities who presented the lectures and noted that hearing them in person was much more effective than reading articles by them (or others). They stressed the dynamism of the lecturers particularly.

One man has attended several conferences this year but marveled that, in his area, there are so few doctors who attend their local efforts to "keep up" or come to such conferences. He hypothesized that perhaps such a necessity wasn't nurtured in their initial preparation.

The other noted that he felt the brochure advertising the session misled him--he suspected it might be just another bunch of boring lectures, and couldn't understand why some of his colleagues didn't come along too, except for what appeared to be a boring format. He urged the emphasis on the "practicum" sessions, e.g., the "presentation of problem cases" and the "small group discussion" case studies in advertising these to help others see the applicable value.

Session I: 9:00 a.m., Thursday -- Dr. Davie

A. Excellent organization, ideas moved one to another smoothly, logically.

B. Evaluator not qualified to comment.

C. 1. Effective: Slides on time; light control smooth; arrow on slides generally well used; conversational speech style.

2. Less effective: At times the arrow on slides was too active and distracted and at other times it covered the material speaker was talking about; two sets of numbers (Roman and Arabic) confused both speaker and audience at times; slides were not consistently light-dark or of same type face which forced readers to extra strain.

3. This seemed to be a statement of current position -- what we now know. As such, it seemed logically essential as a point of beginning. Although the speaker had to shoot in the dark to guess what his audience already knew about this, from general audience receptivity (and conversations with participants) it seemed to hit the mark remarkably well.

9:45 a.m., Thursday -- Dr. Rapaport

A. Organization seemed adequately smooth and orderly.

B. Evaluator not qualified to comment.

C. 1. Effective: Started by exhibiting a sense of humor; he handled a forgotten slide easily without distraction.

2. Less effective: He seemed to be racing at the outset although I got used to it gradually. At the start I felt that he wondered if his "review" was necessary because he almost seemed bored with giving it. His use of the arrow on the slides was very global and distracting. He looked often at Dr. Davie and Dr. Hougie as though he felt he were chiefly concerned with addressing them.

10:50 a.m., Thursday -- Dr. Harker

A. Didn't seem to be a matter of organization; he merely presented a rationale for the manual.

Session II: 2:00 p.m., Thursday -- Dr. Harker

A. Even I was able to start following with some understanding.

B. Evaluator not qualified to comment.

C. 1. Effective: Slides excellent and well used with arrow generally; excellent summary; took less time than allotted;

2. Less effective: Drew in items from morning sessions to good use.

3. Less effective: There seems to be an assumption on the part of all speakers that all these participants see what they see in the slides and in the charts; I wonder if the participants road such data as constantly as the speakers do and therefore don't need help in locating specific material as quickly passed over by the speaker. When obviously new interpretations were at stake, Harker did take time to explain.

Right after lunch it's pretty deadly to have so much dark auditorium with so little active audience participation required.

2:30, Thursday -- Dr. Gardner

C. 1. Effective: Somewhat conversational in presentation; nicely outlined introduction to entire presentation on first slide helped the audience see where he was going.

2. Less effective: Some slides had too much on them; the material not used in the presentation seemed distracting at times.

3. This presentation was less research oriented and more theoretical. I wondered how the participants reacted to this shift (although they were obviously hearing from a specialist's theory). Do they want un-"usable" theories or data they can trust? Or is it an objective to push the thinking of the participants to consider theories of their own?

In the discussion, questions concerning treatment persisted. This raises the question of quantity of practical data--how much should they get or should that be a matter for them to apply later? If so, should they be aware of that expectation before they come?

B. Evaluator not qualified to comment.

C. 1. Effective: Slides uniform; use of arrow controlled, concise.
   2.
   2. Less effective: Initial impact on audience was colder, more reserved than previous speakers; was there an air of defensiveness?

   3. I found out later that many of the participants had received the manual earlier through the mail. The highly technical nature of the data "turned off" some which may account for the general coolness of response sensed by this appraisal. Would a time for questions about it have been appropriate, or a need to use it as the reference it seems to be?

11:00 a.m., Thursday -- Dr. Hillman and panel

A. Although the panelists seemed to frequently move away from the problem cases, Dr. Hillman forced them back to complete the task. Smooth and orderly would not be appropriate terms to apply, but the lack did not distract from this session.

B. Evaluator not qualified to comment.

C. 1. Effective: Hillman won the audience immediately by siding with them "against" the panel of experts. His humor as directed sarcastically toward the panel was well received. When the panelists drew conclusions without thinking aloud for the audience to hear them progressing, Hillman forced them to talk their thoughts.

   2. Less effective: When the panelists' natural interest in each other's work (as contrasted with the work of the participants in the course) was generated, they tended to speak to each other and move away from the basic task.

   3. I wondered at first at the threat which this situation might create with the panelists. However, Hillman started with Dr. Harker, one of his colleagues, and opened the way for the others via this. It also warmed up the audience toward Dr. Harker because he so obviously knew what he was talking about and knew when to stop; in other words, both Hillman and Harker were sensitive to the situation.

4:00, Thursday -- Laboratory demonstrations

Folse:

A. Because this was to be used the following day, it seemed almost illogical to consider after the sessions just held.

C. However, Dr. Folse's presentation was direct, oriented to the "field" use of the equipment.

Hougie-Rapaport:

A. No formal presentation made while I was present.

C. Two persons seemed to dominate the entire time by their questions which may have been relevant to others, but this ended up being a conversation between four persons rather than involving most of the group. When specific cases were mentioned, however, all perked up. See notes on 2:30 session re this.

Harker:

A. Tightly organized and smoothly presented despite allowance for multiple questioning interruption.

C. Mimeo details were available for later reference; delightfully warm response to questions which generated more from many. There was an assumption again about the ability of the participants to do what the presenter was skilled in doing, i.e., find 16 in the slide; speakers must think about the abilities of the viewers to read the data as easily as they do.

Session III: 9 a.m., Friday -- Dr. Gardner

C. 1. Effective: Conversational rather than dynamic.

2. Less effective: I again wondered about the ability of the viewers to read graphs as readily as those do who are steeped in research. Presently my own skills have been in rather constant use re this, but I was not able to follow the speaker as rapidly as he seemed to think I should be able to. Spoke overtime.

9:45, Friday -- Panel on Diagnosis

Bruce: Dynamic, well organized.

Figley: Monotone but exhibited great care in reading his slides that all could follow.

Weinright: Careful description of slides although seemed quite self-conscious in first appearance at least.

Folse: Excellent explanation regarding what to hear and see; the coordinated use of sight and sound impressions seemed to capture the imagination of the audience (novelty?)

Butler: The questioning during his presentation forced audience alertness rather than the usual passive intake of data; although the drawing for first presentation developed the ideas in logical sequence, the second drawing simply took time to create without forcing thought to follow with it. I suggest the use of overhead projector transparencies for such thought development with arrows, etc. drawn on by the presenter when appropriate and/or use of overlays to add to the sequencing.

3. Several questions from the audience sought criteria for decision-making, which seemed to show a felt-need on their part that perhaps the presentations were not making satisfactorily. This was too long a session 9-11:30 without break! The moderator (Dr. Finch) did an excellent job in providing a rationale for each aspect of the presentation by which a unity was achieved that was missing in the previous day s presentations. The end of the session again was reduced to interaction between the participants; perhaps they should have some lunches or dinners together to allow for this and not distract from the learning of the participants. I recognize the value of some of the dialogue as it is "overheard," but it quickly degenerates to matters of primary concern to the researchers rather than the practitioners.

(Although I attended the 11:30 session, I have no significant notes regarding it since I had to leave early to attend a 12:30 class. Then I was able to return for the small group discussions at 3:50.)

Session IV: 3:50 p.m., Friday -- Dr. Hillman, chairman -- Case Study Discussions

A. The case studies forced the focus to an organization, although several comments by the participants regarding the cases might be relevant: Case # (1), p. 1: Question -- the first question is artificial; it obviously wouldn't be such a straightforward case to be included for consideration! On page 3, the third question tells the expected answer; page 4, none of the participants knew what the Hardisty test meant--was it included to distract? If significant, it should have been treated in the earlier sessions.

C. The moderator (even in the obvious presence of this "outside" observer) created an atmosphere of relevance with a sense of authority on his part (although he denied that he fit such a category). He did his thinking aloud as he took a turn on each sheet of each case for all to follow; several times to digress to his "biases" but recognized them as such; it seemed difficult to get the participants into the "guessing" game--that is, they seemed hesitant to put their thinking on the line, but Hartman gradually eased them into an increase of this; this was accomplished in part by keeping the participants from committing themselves to gross errors by leading them down the straight path with gentle nudges.

"HEMORRHAGE AND THROMBOSIS COURSE EVALUATION"

May 23-24, 1968

May I preface my comments with the statement that this is the first of these sessions I have attended or felt remotely qualified to attend. Therefore, I hope my comments are not just a statement of the obvious, irrelevant, too specific or too impractical. In fact, I may have missed the point entirely. However, we were asked to put down our personal ideas, so I did.

The two-day course, I feel, is good because (1) Most of the registrants are probably from out of town--anything less would hardly be worth it, (2) You have a chance to "sleep on it" and therefore get points cleared up the second day which you weren't sure about the first. Some determining factors in its effectiveness are going to be the heterogeneousness of the audience and the scope and depth of material covered. The scope and depth of the material to be covered is determined by the audience you are trying to reach. I feel this was done very well on the whole for this course. The course was well titled and the subject matter for the lectures or sessions quite explicit. Sending the manual out ahead of time was an excellent idea since it cut down lecture time needed for review, nomenclature, theory, etc.

The clinical orientation was good since the audience was probably mostly out-of-town clinicians and technicians who expected to take information home from this course that they could use to improve what they already had. Here I might mention I feel panel discussions of problem cases an excellent and practical teaching device. It brings out the practical problems much more effectively and makes audience participation easier.

Having guest speakers from other parts of the country is a must. It is tremendously valuable from the standpoint of giving different experiences, viewpoints and areas of emphasis.

The lectures on the whole were good. In only one or two cases I thought an excess of time and effort was spent just proving a point and could have been done more succinctly. The questions and discussion from the audience is a good thing; however, the size and heterogeneousness of the audience must be considered.

Small discussion groups are good, but here again, the less heterogeneous the group, the better. Maybe this could be reduced without losing the "fluidity."

My personal feeling is that methodology should have been better covered, but I realize I am speaking as a technologist. The tests to be used and the reasons for using them were mentioned throughout; but what was essentially overlooked--and this may be unique to coagulation--is what I will call "hazard of the laboratory." The primary cause of this is that most of the coagulation tests are biological assays--indirect measurement of activity from which quantity is often inferred. Consequently, the chances for artifactual influence are many and I think dangerous if not recognized. I presume the laboratory demonstrations were meant to take care of this, and this is fine for something specific such as the platelet count and doppler device but general clotting techniques is much too broad a subject to be covered here. Better to discuss the various tests, their limitations, and the hazards inherent in each and how to recognize them. (See recommendations.)

In order that more people get more out of the course, I would suggest the following:

(1) At the beginning of the sessions the registrant could, if he wished, write on a provided slip of paper anything he especially wanted to know or was interested in. These could be placed in a box and collected. It may help in the forming of small discussion groups and give an idea of what the registrants want.

(2) Questions following a lecture and in discussion groups are very good, but sometimes the best questions don't get asked because some people are simply too shy or feel their question might be stupid, irrelevant, or not of general interest. Would it be possible for questions to be written with name of lecturer and have a panel answer these later? This is probably impractical but I do think there is a problem here.

(3) It would have helped me if the lecturers could have passed out a mimeographed summary of their talk with pertinent slides thereon. Maybe I am not a good "adult" student and am asking to be "spoon fed", but since the course in concentrated, retention becomes a problem. In trying to take notes and copy slides, I was in danger of missing part of what he was saying. With the mimeographed sheet I could have merely underlined and written questions in the margin; then what I had to take home would be more organized and meaningful than my present notes are.

(4) For the technicians I would recommend a session in which new techniques or tests are discussed. This discussion would include such things as equipment necessary, ease in performance, reproducibility, specificity, pitfalls (how to recognize and avoid them), and circumstances in which the test would be of value. Actual "recipes" would not be necessary, but a mimeographed list of references would be great.

On the whole, I was very much impressed with the course. It was certainly stimulating and I feel I got a great deal out of it.

Mary Willemin
Coagulation Laboratory
Children's Orthopedic Hospital
and Medical Center

"HEMORRHAGE AND THROMBOSIS COURSE EVALUATION"

My aim in enrolling in the program was to obtain current information on the various parameters of hemostasis and a framework for the rational approach to the diagnosis and treatment of hemorrhagic and thromboembolic disorders. My hopes were realized.

The thought and planning that went into the course was obvious from the first lecturer on. The overall approach to the problems of clotting and then thrombotic disorders was logical, sequential, and complimentary. Its organization and presentation of "take home" knowledge exceeded the two A.C.P. courses I have attended.

The following contributed strongly to the effectiveness of the course:

A. The excellent Hemastasis Manual was succinct with appropriate, pertinent diagrams and charts. It will be very useful long after the course.

B. The hand-out case histories made available for the audience were thought provoking. This again had considerable "take home" value. (They should have been handed out on the first day so that those interested could have worked on them that evening. I noted several people working on them during the second day of the course while the lectures were going on.)

C. The presentation of several problem cases to an expert panel was one of the high points of the session. Dr. Hillman's presentation and moderation was excellent. He was a perfect foil in his persistent questioning of the expert panel over its approach to the problems presented. (More time should have been allotted for this so that the third case could have been considered. Would it not have been more appropriate to have this session toward the end of the course? For example, one case had elements of intravascular clotting and yet Dr. Rapaport did not cover this topic until the second day.)

D. The final small group sessions sound like an excellent idea to allow one to clear up questions on a person-to-person basis. (I was, unfortunately, unable to attend.)

E. The choice of guest faculty was excellent. It allowed for a breadth of ideas and approaches that is unlikely if all the faculty are from the same school. This was demonstrated repeatedly during the course.

F. The excellent breakdown of much complex information on anticoagulation by Dr. Seaman was most helpful. The handouts were of great aid in summarizing considerable, complex information.

G. The choice of experts in various fields: for example, Dr. Rapaport in intravascular clotting and Dr. Harker on thrombokinetics. Their enthusiasm while talking on these subjects was infectious.

Minor deficiencies seemed to me to be:

A. Less than ideal slides in some cases. For instance, if all the slides during the first day had been consistent with the Hemastasis Manual, they would have been more readily grasped by some and would have aided in the repetition and reinforcement of the information in the manual.

B. At times, the projection of slides was very poor with regard to focusing and keeping up with the lecturer. Each time the speaker must wave, repeat his request for the next slide, etc., the train of thought and concentration is effectively broken.

Summary: The course had breadth, variety and currentness. The presentation of material was generally excellent and the "take-home" material could not be improved upon. For my purposes, the course was all that I had hoped it would be. The audience may have been less receptive than it could have been.

Sorry I can't be more critical! It was a good course.

H. P. Potter, M.D.

Example 4

"THE PILOT STUDY OF THE TECHNIQUES USED AND THE TIME SPENT BY PHYSICIANS IN CONTINUING EDUCATION"

Surprisingly little is known about the specifics of the techniques used or the time spent by practicing physicians in continuing education. Approaches to measure each have resulted in significant distortions consequent to the presence of outside observers. The need for such data exists for many reasons, including the determination of success to any change in behavior which may be attempted, i.e., do M.D.'s respond to any innovations in continuing medical education?

The purpose of this pilot study was to obtain data on how one particular group of physicians "continues to learn." A basic premise was that physicians are continuing to learn even though they may not believe enough. The method employed in this investigation was that of a time-and-motion study. For the purposes of the study, physicians' behaviors were divided into two main categories--that related to behaviors directly or indirectly contributing to physician overall "medical learning," and all other forms of behavior--examining patients, driving a car, boating, skiing, etc. The term "medical learning" is intended to be broad, such as socio-economic items, political items related to medicine, but obviously, not all-inclusive. The "medical learning" behavior was subdivided into several categories: 1) Verbal behavior--face-to-face confrontation with professionals, telephone conversations with professionals, conversations with pharmaceutical representatives, attending rounds, lectures, conferences, etc.; 2) Reading behavior--medical journals, both subscription and throwaway, text books, magazines and newspaper pamphlets, books, reports, letters, and consultation reports, etc.; 3) manual behavior--practicing to perfect a skill related to medicine, trying out a new device, listening to heart beats, etc.; 4) all other learning behavior--a written description of each. A diary record of the various learning activities became a matter of simply checking one of the distinguishable categories on a 3" by 5" simplified card form at random times throughout the day. To sample their activities at random times throughout the day, a portable random alarm mechanism--smaller than a pack of cigarettes--was worn by those participating in the study. The random alarm module (RAM) is a self-contained portable, battery-operated device which generates alarm signals at pseudo-random intervals. A small piece speaker plugged into the output jack of the RAM has a period of high frequency whistle (approximately 10 seconds) at random intervals. The basic intervals selected by the factory electronic components are varied during field use averaging 1-3 hours. The user has a small thumb-wheel which is moved after the output signal has caused him to record the necessary data. Moving this wheel sets an indeterminate time into the RAM before the next output signal occurs.

The sample for this pilot study was comprised of five physicians on the staff of the Virginia Mason Clinic, which is recognized as an exemplary representative group of specialty practice. Not only would this method permit documentation of what physicians actually were doing but also resampling after introduction of some new approach to continuing medical education would let all concerned know whether it had any impact.

During this pilot study, the five participants recorded the activities they were involved in at the time the random alarm sounded. A total of 125 responses were recorded on 15 cards. These contained 25 references to continuing education activities or 20 per cent of the responses were so designated. Broken down, these activities included: house staff contact, 1; conference, 2; telephone to doctor, 1; talking to doctor, 2; talking with the nurse, 3; attending lecture, 2; teaching rounds, 7; reading behavior, throwaways, 1; text book, 1; journal article, 2. About 3 per cent of the responses were related to reading behavior; about 17 per cent to verbal behavior. Interestingly, no contact with detail representatives was recorded. No mechanical behaviors or other types of learning activity were recorded during this brief sampling period. The sample of physician learning behaviors was not large enough to make comparison between the sub-categories under reading behaviors or verbal behaviors. These findings suggest that a relatively small proportion of the medical learning activities of physicians are, in fact, those in a category of reading behaviors.

This pilot study did yield information to support the postulates that 1) this method of assessing the learning behavior of physicians is, in fact, a feasible method; 2) the RAM device, even though distracting the physician somewhat from his work, is an efficient and reliable means of providing a random sample of physician activities, assuming that the physicians will conscientiously record their activities at the indicated random time intervals; 3) physicians are able to distinguish between verbal learning behaviors and reading learning behaviors; and

4) hypotheses concerning the learning habits of physicians can be set forth to be tested in a larger study comprised of an appropriate sample of physicians over a sufficient length of time for statistical analysis.

Based upon the findings from this pilot study, the investigators believe these data are encouraging enough to warrant a research project that will yield valuable information that has not been available heretofore. The implications from the results of a larger study could yield significant information about the learning habits of practicing physicians that conceivably influence the nature of continuing medical education programs. Preliminary discussions have been held with a group of rural practitioners; unfortunately, despite the presence of a monitoring senior medical student in their respective office settings, their failure to wear and to record appropriately occurred with such frequency as to make this pilot study totally incomplete. So, too, discussions continue with a group of house staff in the University's residency program seeking to involve them in a comparable approach.

In summary, the examples presented illustrate some of the methods used to evaluate continuing medical education courses. They have included pre- and post-knowledge tests, attitude measures, rating scales, questionnaires, and observations by health and educational specialists. A variety of techniques should be available to gather different kinds of information to assist in making various types of decisions.

More complete write-ups of selected program evaluations are found in the Appendix.

OBJECTIVE 5: Selective continuing education programs as a model for investigating why some physicians choose to participate in these programs and why some choose not to participate.

The two programs agreed upon by the Contracting Officer and the Project Director were "Urology for Non-Urologists" and "Early Detection of Disease." Each participant in these courses was given an information sheet in order to gather demographic data as well as to ascertain why physicians attended, both through the determination of one primary reason from a set of five prescribed reasons and through an open-ended question, "In my own words, my primary reason for attending was...." Self-return post cards were sent to a random sample of physicians who were invited, but who did not attend, requesting 1) demographic data; 2) primary reasons for not attending from a set of prescribed reasons, one of which was "Other"; 3) the physician's opinion as to whether or not he had kept updated regarding most recent research related to his practice; and 4) what topics would prompt the physicians to attend.

For the course, "Urology for Non-Urologists," all the participants were also asked to estimate through a four-point rating scale the usefulness that each ascribed to current medical literature, specifically in the field of urology. On self-return post cards sent to a random sample (n=297) of those physicians who had been invited but who did not attend, a request was made for the physician's opinion about whether he had kept "updated" regarding most recent advances related to his practice, and what topics would prompt him to attend a short course.

Various responses were made to the statement, "In my own words, my primary reason for attending was...." The following are representative of the responses:

> ... to be sure I'm with it.
>
> ... to make certain I was giving the best up-to-date care and diagnosis.
>
> ... to keep abreast, hence adding to one's confidence.
>
> ... a check on my own methods with an eye for updating.
>
> ... as a refresher course.
>
> ... to get the specialist's view on recent developments.

The reasons for attending the conference are given in Table 6. The most frequent response, "not sufficiently updated," was given by 48 per cent of the participants.

Of those attending the conference, 58 per cent viewed current medical literature as "of little use" as a resource for acquiring useful information in the field of urology. Nonetheless, Table 7 shows 33 per cent saw medical literature as "reasonably helpful," and only 6 per cent viewed it as "extremely helpful."

Returns from the non-participating physicians were received from 53 per cent of the sample. Reasons this group gave for not attending the conference are presented in Table 8, the most frequent reason being "could not free myself from patient obligation," followed by "program lacked relevance for me."

Age of physician may be a factor in attendance since the average age of non-participants was 49 years compared to 42 years for those who attended. In terms of their responses, there was no significant difference between attendees and non-attendees regarding whether they were in group or solo practice. Of the non-participating physicians responding, 76 per cent felt they were adequately updated regarding most medical research relating to their practice. Only 7 per cent felt they were not. Seventeen per cent were not sure. This is in notable contrast to the replies of those who attended, of whom only 48 per cent felt they were sufficiently updated ($p < .001$).

"Early Detection of Disease" was the continuing medical education topic of the program for the Eleventh Annual Meeting of the Washington Academy of General Practitioners, planned jointly with this association, the Division of Continuing Medical Education, and the Department of Medicine of the University of Washington. Instructors from the Department of Medicine were selected to make presentations on topics which would be pertinent to general practitioners. Over 200 physicians in general practice from the Northwest attended this conference, most of whom were from the state of Washington. Most of the participants and a random sample of non-participants were queried regarding reasons for attending and not attending this course in a way similar to that discussed above. The participants were asked to check one of three reasons for attending and also, in their own words, give their primary reasons. These data are found in Tables 9 and 10. Nearly two-thirds indicated that the primary reason for attending was because "material would be of help in my practice." It is interesting to note that 29 per cent gave, as a primary reason for attending, "a chance both to learn and to get away." Practicality and a break from practice seemed to rate high as primary reasons for attending.

When given an opportunity to write in their own words why they attended, the most frequent category (36 per cent) was a rather general and vague statement about wanting to learn and/or continue their education. Apparently, a large percentage of those attending found it difficult to state specifically what they hoped to get out of the conference. The second most frequent response (18 per cent) was "to keep updated." This, combined with "review" or "refresher" accounted for 30 per cent of the responses. The fact that 13 per cent gave program topics as a primary reason for attending is of particular interest. The attractiveness of session titles may well be an important motivating factor for some.

In Table 11, it is seen that the most frequent reason (52 per cent) for not attending the conference was "patient obligation." This was followed by "personal or family" reason (24 per cent). Geographical location (at least for those who responded) was not a hindrance to their attendance. One must be careful in drawing generalizations from these data, however, since the replies represent only a small percentage of those who did not attend.

The findings from the survey of continuing medical education for physicians in the state of Washington (see Appendix) are quite consistent with what we found in surveying both participants and non-participants in these two courses. Nearly half of the physicians in this survey said that the greatest deterrent to their attending courses is time; and it makes no difference if the course is in-state or out-of-state.

Of the critical comments, 39 per cent were that the courses were not practical. The Washington State physicians ranked specialty group meetings highest in attendance followed by one to two, three-day symposiums, with extensive postgraduate courses attended least. Specialty group meetings were ranked highest as to overall effectiveness, followed again by one- to three-day symposiums, whereas the county medical society meetings were rated as least effective. The survey further showed that one out of three physicians had suggestions as to subjects which have not received sufficient attention in continuing medical education programs and that the practical aspects of practicing medicine were thought to be slighted most.

In summary, participants and non-participants of two selected courses were studied in search of reasons why physicians attend and why they do not attend continuing medical education courses. Most frequent reasons given for attending were feelings of not being sufficiently updated, the content was seen as material that would be of help in practice, and for educational experience in general. A large number expressed that it gave them a chance to learn and to get away. An analysis of the open-ended responses showed an expressed desire for assurance, confidence, and a sense of practicing good medicine.

These data suggest that those who attend courses have a greater sense of inadequacy while those who do not attend apparently tend to feel they keep updated in terms of their own practice.

Both surveys seem to substantiate the fact that geographical location is not a very significant factor in whether physicians attend or do not attend continuing education courses. However, time and patient obligation are prime deterrents to participating. The practicality and/or relevance of course content to physician practice appear to be one of the most important factors motivating attendance at continuing medical education courses.

Of the reasons given for not attending, the major ones were relevance, whether or not the program lacked relevance, and the fact that many physicians could not free themselves from their patient obligations. With 63 per cent of the physicians who responded citing these two reasons for not attending, it would be well for those planning continuing medical education courses in the future to reconsider the time when such courses are conducted, as well as to plan courses more relevant to physician needs.

TABLE 6

REASONS GIVEN BY PHYSICIANS FOR ATTENDING "UROLOGY FOR NON-UROLOGISTS" COURSE

N=33

Reason	Per Cent
1. Not sufficiently updated.	48%
2. Increasing number of patients with problems in this area.	12%
3. Chance to learn and get away.	15%
4. To be familiar with latest research.	15%
5. Other.	9%

TABLE 7

COURSE-ATTENDING PHYSICIANS' RATINGS OF CURRENT MEDICAL LITERATURE AS A RESOURCE FOR CULLING OUT USEFUL INFORMATION IN UROLOGY

Useful Index	Per Cent
1. Extremely helpful (most important source I use to "update" my practice).	6%
2. Reasonably helpful (I often use this source).	33%
3. Of little use to me (occasionally helpful).	58%
4. Of no use to me (an impossible task).	---
5. No comment	3%

TABLE 8

REASONS GIVEN BY PHYSICIANS FOR NOT ATTENDING "UROLOGY FOR NON-UROLOGISTS" COURSE

Reason	Per Cent
1. Could not free myself from patient obligation.	33%
2. Program lacked relevance for me.	30%
3. Unsatisfactory previous experience with short course.	1%
4. Inconvenient location.	7%
5. Personal or family reasons.	12%
6. Too expensive.	5%
7. Other.	12%

TABLE 9

PRIMARY REASON GIVEN FOR ATTENDING WAGP CONFERENCE

Reason	Per Cent Response
1. I felt material would be of help in my practice.	65%
2. A chance both to learn and to "get away."	29%
3. I wanted to find out newer methods in diagnosis.	6%

TABLE 10

PRIMARY REASON FOR ATTENDING BASED ON OPEN-ENDED QUESTION

Categories	Number	Per Cent
1. Educational (General)	55	36%
2. New material--keep updated	27	18%
3. Program topics	20	13%
4. Review and/or refresher	18	12%
5. Professional organization--socializing	9	6%
6. Practical material	8	5%
7. Diversion	6	4%
8. Professional credit	5	3%
9. Other (proximity, tax deduction, "pearls")	4	3%
Total	152	100%

TABLE 11

REASONS GIVEN FOR NOT ATTENDING WAGP CONFERENCE

(N=52)

Reason	Per Cent
1. Patient obligation	52%
2. Programs lacked relevance	2%
3. Unsatisfactory previous experience with short courses	0%
4. Inconvenient location	6%
5. Personal or family reasons	24%
6. Too expensive	0%
7. Other	16%

OBJECTIVE 6: Develop and field test evaluation procedures of clinical communication systems, e.g., hospital patient discharge summary sent to local medical doctors, telephone conversation and/or correspondence between hospitals and referring physicians, etc.

An initial appraisal of the impact of consultants' reports in our region had already been conducted at the time of the initiation of this Contract. A copy of the report focusing on reaction of the recipient is included; under the aegis of the Contract, a follow-up study focusing on content analysis (also included) was conducted. As can be noted from the data presented, in the absence of the transmittal of additional information, the traditional consultant's letter "summary" proved remarkably effective in bringing to the local community physician between 75 and 90 per cent of the totality of information he needed to act appropriately with this patient. While some deficits did exist, it is fair to conclude that any deleterious effect on patient care would more likely arise from non-application of the information as opposed to its non-transmittal. The inference was drawn that on theoretical grounds the discharge summary or consultant's report ought have signigicant impact as a vehicle for continuing medical education. The Department of Medicine at the University of Washington has been approached and is currently considering implementing some of the recommendations offered.

Yet another clinical communication system has received preliminary consideration. After some four years of discussion and with a multitude of support techniques, "Medical Radio Conferences" were introduced to the Pacific Northwest in September, 1968. In collaboration with the University of California (San Francisco), the Project Director arranged for the production of some 18 hour-long local panel discussions on a variety of medical topics. When these were added to those generated in San Francisco and the series broadcast, the potential existed for broad reception throughout Washington and into parts of Alaska. Moreover, an additional series of conference calls was held with the 46 physicians in Southeast Alaska--via seven location points following their local choice and review of relevant topics.

Despite only a year's experience, it was deemed desirable to try to gather some simple measures of reception and potential receptivity. Both interviews and questionnaire post cards were used, neither of which was financed by the Contract. Replies were secured from 65 of the 120 hospital staff throughout the state--some 30 of which were, unfortunately, outside the reception area. Personal interviews were conducted at some 20 institutions in the Puget Sound area and in Spokane. The questionnaire returns can be summarized as follows:

Fourteen hospitals have already installed FM radios and another 14 are in the process of doing so. Nineteen staffs are known to have listened to the program series on at least one occasion as a group; the total number of individuals involved is not known. Twenty-five of the hospitals look forward to involving nurses and other allied health workers and 13 indicate they would be willing to pay $100 a year for subscription costs. In view of the limited promotional campaign involved, this is somewhat of a more favorable response than anticipated.

OBJECTIVE 7: Evaluate the recently initiated seminar program conducted by representatives from the Schools of Medicine, Architecture, Education, and Communication Arts for those faculty members participating in continuing medical education programs. The purpose of this seminar program is to improve understanding of the learning processes and to improve teaching skills.

As noted in the previous correspondence to Mr. Norman E. Tucker (May 5, 1968), shortly after the initiation of the contract, the seminar program referred to in Objective 7 was discontinued. Preliminary appraisal of the previous seminars was forwarded with above-mentioned correspondence.

OBJECTIVE 8: Select two additional continuing education activities conducted by the School of Medicine for evaluation purposes. Activities to be selected may include: relevance of medical student appraisal programs for practitioners education; relevance techniques currently employed to assess needs of residency training programs; and methods to improve the quality and impact of medical journals.

Even though the original intent was to select two programs to evaluate, more than two were evaluated under this contract. Evaluation reports are found in the Appendix for the following programs:

1. Urology for Non-Urologists
2. Computer-Assisted Instruction
3. Early Detection of Disease
4. Central Washington Project (Yakima)

A study of internship advisors is also included; so, too, are four graphic representations of a Semantic Differential inventory of students and faculty attitudes and their surprising congruences. Both have implications for continuing medical education.

In addition to these, the contract staff consulted in the development of measuring instruments, objectives, and evaluation designs with the Washington/Alaska Regional Medical Program staff and project directors for other projects including:

1. Sub-Regional Coronary Care Educational Programs
2. Postgraduate Preceptorships for Physicians
3. Guest Residency Program
4. An Educational Program in Finding and Treating Lung Failure

In conjunction with the pursuit of Objective 8, preliminary studies have been initiated regarding the impact of medical journals. The relevant usefulness of current medical literature as detected from our "Early Detection of Disease" (Olympia) and "Urology for Non-Urologists" studies (Objective 5) is reported in Tables 12 and 13. The general practitioners found specialty journals least helpful as a resource for culling out information. General journals and "free" journals are seen as extremely useful by 24 per cent and 14 per cent, respectively. Specialty journals were seen as "of no use to me" by 12 per cent of those attending the Olympia conference.

The Project Director has extended a study begun several years ago into the characteristics of pediatric specialty journals and their continuing medical education relevance. Two preliminary reports available to date (attached) permit inferences to be drawn--again pointing up the contradictions which evolve when a given task is contrived to solve two or more almost mutually exclusive problems. Phrased differently, how can a publication looked to by readers for clear, concise updating of relevancy, deliver such information when it is prepared by non-practitioners with content reflecting either their research interests or their personal publication needs? Although we have no immediate recommendation to resolve the problem, we are proceeding first to attempt to define its extent and then to evolve alternative approaches to resolution. As a consequence, additional studies are being planned on this particular topic.

TABLE 12

PER CENT OF GENERAL PRACTITIONERS WHO PERCEIVE CURRENT MEDICAL LITERATURE AS A HELPFUL RESOURCE FOR CULLING OUT USEFUL INFORMATION

Type of Journal	Extremely Helpful	Reasonably Helpful	Of Little Use To Me	Of No Use To Me
General Journals (i.e., JAMA(GP), NEJM)	24%	62%	14%	0%
Specialty Journals (i.e., Ann. Int. Med., J. of Peds., etc.)	6%	38%	44%	12%
"Free" Journals (i.e., Med. Wld. News, Mod. Med., etc.)	14%	57%	26%	3%

TABLE 13

CURRENT MEDICAL LITERATURE AS A RESOURCE FOR CULLING OUT USEFUL INFORMATION IN UROLOGY

Useful Index	Per Cent
1. Extremely helpful (most important source I use to "update" my practice.	6%
2. Reasonably helpful (I often use this source)	33%
3. Of little use to me (occasionally helpful).	58%
4. Of no use to me (an impossible task).	___
5. No comment.	3%

Preliminary Report: submitted to
American Journal of Diseases of Children

PUBLISH, PERISH--OR POOP OUT

Piqued by curiosity, I recently updated a study begun some ten years ago. The object: to look at our pediatric journals, to see what they are saying, who is saying it, how long they take to say it, etc. The subject: Pediatrics, The Journal of Pediatrics, and The American Journal of Diseases of Children; (at inception, Clinical Pediatrics was not yet on the scene). The method: Simply set up criteria, count and record data by specific journal; then compute averages, percentages, and so on. The years covered: '58, '59, and '60 versus '67 and '68. Nothing too fancy--save for application to the recent set of Feinstein's memorable categorization on "Non-human-non-disease" papers--one other way of grappling with the issue of relevance of journal content to problems of practice.

Each of these three journals provides nearly 1,000 pages of textual material every six months. Figuring 700 to 1,000 words per page, the average reader proceeding at 300 words per minute for reading--not necessarily for "studying" or "understanding"--would take approximately 160 hours every six months or about six hours a week to consume their respective contents. Even then, he would have missed almost 65 per cent of the pediatric articles abstracted by the Yearbook of Pediatrics--and purported to be important. And, were he to add them, he would encompass only articles immediately related to the field. Obviously, the "crunch" is here, the squeeze is on--and it has been for a long time. Some available options: read faster, become more selective, or throw in the sponge. Not particularly attractive alternatives; only the second can be considered acceptable and even that holds reservations.

Rest assured, however, that authors have yet to throw in the sponge! As de Solla Price confirms, the information explosion as he calls it--or is it simply a "publication inflation"--continues so that output of papers and journals doubles about every 15 years.(1) While the rate remains relatively constant--and has for more than two centuries!--the absolute numbers of papers continues to burgeon geometrically. And, so do the number of authors. Of the more than 1,500 pediatric articles published in the initial interval, some 30 per cent had a single author; only 15 per cent "required" four or more. Over the ensuing decade, a change has occurred; now only 25 per cent of these pediatric papers are sired by an individual; multiple authorship--four or more--accounts for 21 per cent; and over the past five years in our Pediatrics Department at the University of Washington, multiple authorship accounts for 24 per cent of all papers produced. One wonders why.

Considerably more dramatic--and conjuring up all kinds of additional speculation--is the fact whereas '58-'59-'60 saw some 74 per cent of articles spawned in the medical schools, '67-'68 saw more than 87 per cent originate there. And of the 13 per cent that did not, a significant proportion stemmed from the armed services--and the NIH! By these criteria, practicing pediatricians are the "silent majority."

Conclusion: Has the time-squeeze for reading lead to a retreat from writing? Possibly, but I doubt it. More plausible possibilities are obvious. Is it that the two worlds of medicine--academia and practice--like Snow's two cultures, are simply moving further apart.(2) Practicing physicians apparently are not recording their observations or, if they are, they are having their efforts at writing rejected by Editorial Boards--a seemingly unlikely occurrence. Could it be that virtually every pediatrician and his brother is able to secure a faculty appointment so that the "University without walls" is in reality a fact of life? Were this option correct, it would portend real excitement for the future. Should it be another, i.e., that of "separatism," however, it could spell doom--and not simply for pediatricians and the profession, but also their patients. Careful observation, critical analysis, and concise, clear recording of clinical experiences, is a sine qua non of the practitioner who proposes to continue in the forefront of medicine. Although "publish or perish" may be the scoffed-at motto of academe, it is extremely relevant to his frame of mind. And, it is perhaps even a more relevant concept for the practitioner unless he is to "poop out."

The process itself, as Woodford has emphasized, can be a revitalizing experience when such are clearly needed by all of us.(3) Thus, a plea to practitioners for prophylaxis in practice; prepare a paper for publication--promptly!

References

1. Price, D. de S., Little Science, Big Science, 1963, Columbia University Press. New York, 118.

2. Snow, C. P., The Two Cultures: and a Second Look, 1963, Cambridge University Press. New York, 92.

3. Woodford, F. Peter, Sounder Thinking Through Cleaner Writing, Science, 156: 743-745, 1967.

PEDIATRIC PERIODICALS--PLAUSIBLY PERTINENT

Awe-inspiring in their objectives, overwhelming in their numbers, scientific periodicals have obtained an almost deity status. Their annual content of two million papers is predicted to double within the coming generation. Medical journals spew out a significant portion of this total "literature."

By invoking his medical journals regularly the practitioner of medicine is said to learn to perform modern day miracles. By ignoring them, he is purported to risk the damnation of diagnostic and therapeutic obsolescence. In point of fact, however, both the medical practitioner and the medical educator, be either a worshipper of the printed page or an agnostic, need to consider the question, "Does the physician actually learn from his journals?" Several reviews document the paucity of data relevant to this issue. This paucity prompted the following study of pediatric periodicals, their contents, and consideration of their relevancy to the problems and practice of this specialty.

Today's pediatrician is cast in a unique role as he is simultaneously encouraged to "care" for the whole child, the whole family, and in many ways the whole community in sickness and in health, physical as well as mental, until death (or adolescence or some other arbitrary concriterion) do them part. Having built himself a firm foundation by consuming a medical school curriculum, an approved internship, and a pediatric residency experience primarily with sick hospitalized children, the pediatrician in practice deals primarily with ambulatory well children and their mothers. He attempts to maintain his specialty competence by a mixture of "postgraduate" endeavors. Paramount among these is devouring, absorbing, catabolizing, and occasionally even using information provided in medical journals.

While more than 13,000 periodicals are directly or indirectly relevant to the medical care of his charges, the pediatrician focuses, to a large extent, on three monthly specialty journals and one quarterly periodical to keep informed of pertinent pediatric events. Respectively these are "Pediatrics," the official publication of his professional association, the American Academy of Pediatrics; "The Journal of Pediatrics," an independent publication; and the "American Journal of Diseases of Children," the pediatric specialty publication of the American Medical Association. His quarterly is the "Pediatric Clinics of North America," a publication of Saunders Publishing Company. Of the former group, each issue carries reports of original scientific investigations as well as reviews of clinical cases; each devoted one section to worthy news releases, another to book reviews, and each has its own unique additional sections and format, i.e., editorials, diagnostic dilemmas, etc.

In an effort to develop a profile of the first three journals for a comparison among them and their potential relevance to pediatric practitioners, a simple study has been carried out in terms of:

1. The total pages of textual material per volume as well as the total number of articles.

2. The types of articles contained therein--i.e., "original" article versus case report.
3. The sources of the article--academic or practice.
4. The geographic origins--region of the country.
5. The number of authors involved.
6. The distribution of topics covered.

Relevant data have been accumulated for the years 1958, 1959, and 1960 as well as 1967 and the first half of 1968.

Results and Discussion

Tables 14 through 17 are in large part self-explanatory, providing measures of size, origins, and contents of the three leading journals. Some points warrant additional emphasis, however:

1. In terms of respective objectives as stated by the three journals, and by their predecessor which has now disappeared from the scene (see Attachment), it is likely that all three have been and are being successful--in large part because of the manner in which the objectives were written rather than in terms of what specifics the journals themselves have done or are attempting to do.
2. In terms of the broad issue of contents, the similarities among the three journals are far more striking than are any differences.
3. In terms of relevance of content either to medical problems confronting pediatricians on a day-to-day basis (as determined from existing sources) or to those seen as warranting

more attention by practitioners as determined by Aldrich, Deisher, etc., there would appear to be little evidence of any significant relationship. Such is understandable when authorship and authorship purposes are considered. That is, by and large, authors not only are not practitioners but they are writing in response to their own interests, activities, and needs as opposed to those of potential readers.

4. In terms of authorship, the practicing clinician appears to be going the way of the "dodo bird" and is on the road to extinction as he contributes less than ten per cent of the articles included--and this percentage is falling. So, too, the single author is being replaced by a "team" possibly formed more for the purpose of promotion than for the purpose of publication _per se_. A recent letter to the New England Journal of Medicine (280: 1484 June 26, 1969) confirms this impression as a 40-year span has seen the number of single authors fall from 78.4 per cent in 1928 to 3.1 per cent currently of the spawners of articles.
5. In terms of length, however, some evidence is seen that parsimony may be in the wind--despite the increment in authorship.

Summary

Confronted with an alleged scientific and technologic explosion--or is it simply a "publication inflation"--the medical practitioner is encouraged to update himself via his professional journals. On the basis of a review of the origins and contents of his professional journals, pediatricians as a class of medical practitioners are not likely to attach much relevance to pediatric journals' contents--at least in terms of their everyday practice or of the "real-life health problems" of their patients. This discordancy is likely to increase as practitioners cease to serve as authors and as authors continue to write with an aim toward impact on an almost negligible proportion of potential readers. Conceivably, the "throwaway" or "controlled circulation" journals may help stem the tide of postulated professional obsolescence, but the words of Sir Theodore Fox, Vandervere Bush, and Peter Woodford regarding options to sustain "this remarkable instrument of medical communication" must be acted on--and soon.

TABLE 14

GENERAL CHARACTERISTICS

	TOTAL TEXTUAL PAGES	TOTAL ARTICLES	$\overline{X}$ PAGES/ARTICLE
PEDIATRICS			
58, 59, 60	6820	624	10.9
67, 68/2	3232	388	8.3
JOURNAL OF PEDIATRICS			
58, 59, 60	5076	498	10.2
67, 68/2	2940	419	7.0
AMER. J. DIS. CHILD.			
58, 59, 60	5084	452	11.2
67, 68/2	2262	362	6.3

TABLE 15

PERCENTAGE DISTRIBUTION OF TYPES OF ARTICLES

	ORIGINAL ARTICLE	CASE REPORT
PEDIATRICS		
58, 59, 60	78	22
67, 68/2	78	22
JOURNAL OF PEDIATRICS		
58, 59, 60	66	34
67, 68/2	71	29
AMER. J. DIS. CHILD.		
58, 59, 60	76	24
67, 68/2	58	42

TABLE 16

PERCENTAGE DISTRIBUTIONS

OF

ORGANIZATIONAL SOURCE OF ABSTRACTS

	MEDICAL SCHOOL	OTHER
PEDIATRICS		
58, 59, 60	70	30
67, 68/2	89	11
JOURNAL OF PEDIATRICS		
58, 59, 60	76	24
67, 68/2	87	13
AMER. J. DIS. CHILD.		
58, 59, 60	75	25
67, 68/2	84	16

TABLE 17

RELATIONSHIP OF CONTINUING MEDICAL EDUCATION "NEEDS" TO JOURNAL RESPONSE

Comparison among five leading pediatric topics as determined from a) Reports of Patient Loads, b) Surveys of Pediatricians' Opinions, and c) Analysis of Topic Coverage of Pediatric Journals

a) Patient Load Studies

Nat. Disease and Therapeutic Index N=10,000	Cornell Family Study N=2,200	Brooke Army Dependents N=293,000	Boulware Private Practice N=750,000
1. Immunization and Vaccination	1. Common Cold	1. Respiratory Illness	1. URI's
2. General Examination	2. GI Illness	2. Skin and Soft Tissue	2. Well-Baby Exams
3. Otitis Media	3. Sore Throat	3. Total Body Illness	3. Total Body Infections
4. Acute URI	4. Rhinitis	4. Digestive Disorders	4. Acute Pulmonary Illness
5. Tonsillitis	5. All Others	5. EENT	5. Immunization and Vaccination
(Nat. Diseases and Ther. Index: A Study of Pediatrics, 1957)	(McCarrol: Personal Communication)	(Ped: 22:366 Aug. 58)	(Ped: 22:548 Sept. '58)

b) Survey of Pediatricians' Opinions

Aldrich Study N=1,147	Deisher Study N=124
1. Allergy	1. Behavior
2. Psychiatry	2. Fluid Balance
3. Behavior Problems	3. Normal Growth
4. Cardiology	4. Allergy
5. Dermatology	5. Infectious Diseases
(Careers in Pediatrics, Ross. Ped. Res. Con. Report, 1960)	(J. Med. Ed.: 33:579 Aug. '58)

c) Analysis of Journal Topic Coverage N=1,574

1. Total Body Conditions
2. GI Diseases
3. Blood Disorders
4. GU Problems
5. Neurologic Problems

ATTACHMENT

Specific Statements of the Journals' Objectives

PEDIATRICS, 1: 4, 1949

"Perhaps the chief of these is the intent of the Editorial Board to publish an outstanding journal whose articles will be practically helpful but which at the same time will be challenging in their scientific content. And I am sure we all must admit to a certain pride of ownership."

JOURNAL OF PEDIATRICS, 1: 143, 1932

"The editors wish to explain briefly at this time the scope of the JOURNAL OF PEDIATRICS. It is their intention to make it as broad and inclusive as the field of childhood itself. It is planned not only to include the clinical and investigative fields of pediatrics but in addition those tangential fields of medicine and child development which give to pediatrics such a unique position among the medical sciences. Thus the fields of public health relations and movements, child psychology, socio-medical conditions, education, as well as the more strictly medical branches; as for example, surgery and its subdivisions, or dermatology, will be included in the material which the journal will present to its readers in so far as they relate to the field of pediatrics."

AMERICAN JOURNAL OF DISEASES OF CHILDREN, 1: 1, 1911

"This new journal of ours, the AMERICAN JOURNAL OF DISEASES OF CHILDREN, however, the first number of which we herewith offer to the profession, is not published to compete with those already in existence . . . with the increasing number of physicians interested and working in the field of pedology, there will be more than merely a vast number of papers; there will be more profundity and research. These our new journal is to gather in, and it is to be the companion and ally of the Archives of Internal Medicine. It may rarely give a mere case, still more rarely a prescription; it is to be a receptacle, however, of the very latest in the very best of American and European literatures. But extracts will be few in proportion. Reviews, carefully prepared by competent critics, will be offered from time to time. The bulk of the contents, however, will be original; anatomy--both embryonal and postnatal--physiology, biochemistry, nosology, and therapeutics will come to their own, and will be welcomed as our sources of actual progress."

ARCHIVES OF PEDIATRICS, 13: 1896

"These facts being appreciated, the true work of the pediatric journal is rendered clear. It is the medium of communication between the observer and the practitioner. By observer is not meant simply the laboratory worker and the pathologist, but it includes the physician of the hospital and dispensary. It is not limited even to these, for we should not fail to appreciate the invaluable experiences gained by the general physician. To him we allot ample space in these pages and urge more frequent publication of the knowledge which he gains in his daily contact with disease. On the whole, however, it must be admitted that the most important and substantial advances in knowledge result from the researches of special workers. The wisely conducted medical journal, will be, therefore, in large degree, the medium of communication between such special workers and that great body of men who do the practical work of the profession.

As the department of pediatrics cannot be restricted to a few consultants in large cities or teachers in medical colleges, so the pediatric journal cannot be limited in its scope. While its best contributors are drawn largely from the ranks of the true specialists, the man to whom it should prove of the greatest actual value is the general practitioner, to whom the diseases of children are of such vital importance. The true aim of such a journal should be the education of the profession at large in the important department which it represents. It should constantly strive to place the knowledge which is being continually accumulated by skilled observers, in such forms as to be most available for practical use. It has been the aim of the ARCHIVES throughout its whole history to attain this end, and no departure will be made from this policy.

OBJECTIVE 9: Develop a comprehensive plan from the activities (1 through 5 above) for a continuing education center for physicians. This plan shall:

a. Determine the functions to be carried out by the center,

b. Set forth working procedures to be followed in establishing the center,

c. Select specific areas of study and priorities of work to be undertaken by the center,

d. Recommend a detailed scheduling of tasks to be undertaken for implementation of this plan.

On the basis of our interpretations and discussions of the foregoing as well as the existent literature, e.g., the Dyer report, the Millis Commission report, the Royal Commission on Medical Education, the Coggeshall report, etc., we would endorse or propose the following premises as essential for any comprehensive plan of continuing education to be successful for physicians in the Pacific Northwest:

1. From the time a physician first enrolls as a medical student in a medical school until the time of either his retirement or his demise, he ought to be maintained on one of three rosters of students of that school--or a consorting school: an undergraduate roster, a graduate and postgraduate roster, or a continuing medical education roster. Such would set the stage for agreement as to mutual obligations and those of organizations and individuals as well as a feedback system.
2. The student who is progressing through the above three phases will receive less and less specific direction as he assumes increasing personal responsibility for his own"curriculum and learning."

Just as the grade school child has much of his curriculum spelled out for him in detail, the medical student of the future--despite the fact that he will have increasing opportunities to become involved with his curriculum design and content--can continue to look forward to faculties of schools of medicine or others in society prescribing large segments of curriculum in undergraduate years. But as students progress in their training, these outside influences diminish. The individual takes over the decision-making to an ever-increasing extent. And although medical school faculties are currently almost non-involved in curriculum matters for continuing medical education, it is postulated they will plan an increasing role--but still a very minor component compared to that which will be lodged in the individual physician of the future.

3. The past decade has seen a far closer interdigitation of existent medical schools and medical school faculties with each other and a surprising degree of standardization among them. The next decade will, in all likelihood, see comparable consolidation of resources and centralization of many components of the educational process of graduate and postgraduate physicians (house officers--interns and residents). It is assumed that a comparable network of interrelationships will shortly be formed at the continuing medical education level to involve not simply individuals but also the universities, the American Medical Association, the Association of American Medical Colleges, and specialty boards--as well as interested consumers!

4. Work currently underway at the primary and secondary school level is blending the multitude of new technologies of instructional media into the educational matrix. Work currently underway at the undergraduate level in medical schools is also blending in this new instructional media but, more significantly, it is also incorporating application of educational principles in the teaching-learning process. It is assumed that, shortly, this process will be extended to graduate and postgraduate training and then, in a far more significant fashion, into continuing medical education activities. In point of fact, the possibility exists that both the new instructional media and the educational principles may become better integrated in continuing medical education before being adequately exploited in the other two areas. Over the long run, we would foresee the development of "learning profiles" for individual medical students and physicians, learning packages for translation into the various media--printed words, television, programmed instruction, computer-assisted instruction, etc. In short, refinements are well underway in the techniques of transmitting new information and/or skills to students and in predicting their reception and application of same.
5. While the past generation has seen tremendous "hypertrophy of the hard sciences" components of medical education and medical practice, evidence today suggests that the pendulum is swinging toward a more central position of involving the social sciences far more extensively in the overall process. Perhaps trainees in medical

school in the 1950's were overly imprinted to perceive only biochemical bits as opposed to psychological, social or economic bits as being relevant to medical practice--or deserving of continuing medical education efforts. The 1970's are likely to see the psychosocial components assume command. Such a transition in priorities is of major significance in considering any determination of "needs and wants" for the continuing medical education process.

6. As the educational process in medical school continues to evolve from a highly structured, admittedly sometimes punitive approach with much concern for failure on the part of the students to a more positive non-threatening process, we believe that the graduates of such programs as they enter into postgraduate and continuing education activities will be far more comfortable in looking at their own strengths and weaknesses without fear of reprisals and thus participate in realistic determination of continuing medical education needs. Little doubt exists that many physicians today find it difficult to welcome exposing themselves to the possible onslaughts of the "geheimrat" professors of their medical school memories.

With the above premises, postulates and assumptions in mind, we would at first reject the concept embodied in a "Center for Continuing Medical Education for Physicians," assuming the term "Center" carries with it the usual connotations of centralization of control, power, and decisions so prevalent in the modern academe mentality. We find the centralization implied an anachronism. It is totally inappropriate for what the future holds. Obviously, a function such as continuing medical education would suffer disastrously if seen as being confined to a single physical facility with a region or directed by a single individual and his professional societies but, equally importantly, of the medical schools and adult education. Thus, in the state of Washington, the state universities, state colleges and state community colleges would each play a role in the process of continuing medical education--in addition to the existent associations, societies, local hospitals as well as the individual physician.

Our investigations of the Regional Medical Program-University of Washington Preceptorship Program for physicians, the Yakima-Central Washington survey of "wants and needs," our collaboration with Green River's studies, with the Washington State Medical Education and Research Foundation survey, and with work beginning among the Community Coordinators all serve to stress the desirability of a focus on decentralized and individualized programs. Moreover, our look into why physicians don't attend courses--real-time and patient-load problems--suggests that this decentralization process needs continue. Finally, even though newer media have begun to make possible such decentralization of dissemination of process, they, in fact, tend to centralize the decision-making process about what, when, who, and why given material ought be disseminated--an undesirable goal to say the least.

Accepting this argument gives rise to the need of coordinative roles and missions; only if the coordinative roles are inserted via "participative management" into the definition or concept of a "center," do we feel the real goals of continuing medical education will be achieved. While such a philosophy may appear to be both naive on the one hand and unfeasible on the other, we feel that it blends with our findings and that it is most appropriate to look at the so-called idealized image and outline it--and then develop compromises rather than to compromise with principles expressed.

In such coordinative endeavors, four specific functional areas must be partitioned between individuals and organizations in terms of policy decisions and actual conduct:

1. The determination of needs--knowledge, skills and attitudes--to maximize current practices as well as future activities--both from the consumer's point of view and from the provider's. Obviously, even if the physician benefits maximally and there is no spin-off to the patient, the needs have been inadequately defined. On the other hand, if only the patient is considered, it may be that the physicians would become increasingly ineffective. Self-appraisal approaches as well as group approaches warrant exploration.
2. The appropriate packaging of knowledge, skills, and attitude-forming techniques to respond to the stated needs will obviously entail group effort--but ought have individual stimulus.
3. The transmittal of these packages to the physician--and perhaps to his patient--will involve complex media as well as simple individual verbal communication.

4. The evaluation of whether the transmittal of the prepared packages does, in fact, satisfy the needs specified will call for skills of both organizations and individuals.

In setting forth working procedures to partition responsibility for these areas, several steps seem critical. They are:

1. More careful specification and quantification of the existent problem and the premises stated above in an attempt to reach conceptual concordance with all the necessary individuals and organizations. Both group and individual decisions must be made whether to commit efforts and resources toward refinement and sharpening of existent tools of continuing medical education or to attempt to create an entirely new set of organizations and tools for this purpose. We assume they will opt for the former alternative.
2. Several years of discussion and involvement with the individuals and organizations to attempt to bring about a commitment to the philosophy outlined above. Here it would be critical to involve medical students at the entering level as well as those in other classes of the school. Of particular relevance now is involving faculty and house officers in moving this particular function (i.e., undergraduate, postgraduate, and continuing education) higher on their professional priority list. There seems to be an inherent assumption that the faculty of a school of medicine can breathe easily once a student has graduated--so they can concentrate on other entrants. One immediate measure in implementing

our plan would be to have this broad objective of lifelong involvement stated and endorsed in the long-range plan of any medical school--i.e., a commitment to equal efforts on behalf of the school for the three levels of education involved. Let those responsible for funding follow through on that detail of implementation.

3. Development of task forces with specified action deadlines representing the involved organizations and individuals to focus on:
    a. Financing options.
    b. Decision-making processes.
    c. Communication networks.
    d. Evaluation techniques.
4. Further expansion of the Washington State Medical Association-Washington/Alaska Regional Medical Program-University of Washington Council of Community Coordinators to include membership from representatives of various state and community colleges. Gradually, other allied health professionals should also be added so that eventually the resultant body can serve not simply as a forum but also in decision-making regarding recommendations for facilities and equipment all of which need to be planned toward compatibility of health sciences education. Conceivably this group will perceive the value of establishing a more structured coordinative-administrative unit with the Council's membership serving in a "board-of-trustees capacity." We'd see such units organized to:

a. Develop still better need-determination and planning services.

b. Develop appropriate "dissemination networks" for television radio, telephone, as well as films, learning packages and eventually computer-assisted instruction.

c. Develop and publicize a library of existent programs and activities as well as personnel resources. Here a particular advantage exists in the already active Pacific Northwest Regional Health Sciences Library, which fills this role for printed materials.

d. Develop new or better utilize existing evaluative skills and services.

e. Develop, in consort with the College of Education and the various schools in our Health Sciences Division, training programs to prepare discipline-based individuals to assume responsibilities for the management and evaluation of continuing education activities. We view such training programs as being the most critical ingredient of any long-range comprehensive plan for continuing medical education--if it is to be truly responsive to health care needs of the community via implementation of educational principles. For example, we would call attention to the findings of our study on the use of Rho-Gam (Rh-immune globulin) and practicing physician comprehension of the pathophysiology involved. Obviously, at this point in time, no additional continuing medical education efforts need be undertaken to transmit relevant new information although reinforcement activities may be called for. In its stead, we would view instruction in techniques of communication with patients and persuasion principles as indicated. Thus, need determination must precede the implementation phase; here, even the minimum basis of understanding of educational principles permits appropriate action.

Finally, we recognize the impact of individual personalities in the implementation of this particular plan; if participants are aggressive, but not domineering, if they are capable of participating in two-way communication as opposed to monopolizing via unilateral pontifications, the program can be successful. The right people in the right setting could get the aforementioned program into full operation within a year provided a minimum of sustaining budget were developed. In contrast, the wrong people devoid of any budget would not simply prolong interminably an ever more ineffective program, but might postpone for decades any rectification of the problems that would ensue.

SECTION III

A researcher is confronted with a variety of challenging problems in a study such as this. Also, unexpected outcomes emerge. In this section of the report, our attention is centered on the problems, recommendations, and implications of the study.

PROBLEMS ENCOUNTERED:

A number of problems were encountered, some of which are listed as follows:

1. The breadth and depth of the issue under consideration, the extent and ramifications of continuing medical education itself, presented an inherent problem of focus. Attempting to view the broad spectrum of continuing medical education meant that parameters for investigation were virtually unavailable. Nevertheless, an attempt to take an overview of an area such as continuing medical education is important in order to provide for interrelations of the several component parts so that the total emphasis will be more unified and therefore more effective and efficient.
2. Professional resistance. Because of the natural "threat" to group solidarity and the professional image that arises when any "outside" party questions that group's practice and behavior, the physicians as participants were somewhat suspicious. Also, perhaps because of the "soft" reputation of education's body of knowledge, there was a fair amount of skepticism about

measurement procedures and the validity of the instruments.

Four other factors are postulated to contribute to this resistance to exposing personal professional inadequacies--i.e., assisting in the determination of needs:

a. The past decade has seen a real shift in organizational power blocks in medicine. Medical schools have burgeoned and assumed a tremendous control; hospitals are booming and capturing more and more power. County medical societies are lagging--especially on the educational forefront. In some ways--in many ways--the individual physicians no longer count. Further change from the good old days is not always welcomed.

b. The past generation has seen an elevation of the specialist and deprecation of the generalist. Part of the specialist image is to be interested "in his thing." Retention of this image was maintained by not expressing interest in "our thing."

c. Success in a professional practice--like beauty--exists in large part in the eyes of the beholder--in this instance, professional colleagues. Any public or group declaration of internal inadequacies in the group could only serve to tarnish such an image with obvious real-life consequences to those involved.

d. For centuries the "professional" has evolved a self-accountability concept as part of his image. Opposition to this is increasingly obvious; relicensure and recertification are common--and threatening--words. Such implies that outside forces are out to assume total control of the professional. Hence, some reluctance to cooperate with another outside force.

3. The relative novelty of research in medical education. The idea of studying medical education was greeted with skepticism not simply by individual physicians but by medical organizations including the School of Medicine, the State Medical Association and many professional societies. So, too, some of the organizations involved in this study were also novel—our Office of Research in Medical Education, the Washington State Education and Research Foundation, and The Washington/Alaska Regional Medical Program. All of this unfamiliarity presented problems.
4. Difficulties emerged due to the absence of a) an accepted theoretical construct for continuing medical education, b) a concurrence as to its goals by individual physicians and their professional organizations, c) an extensive literature in the field, and d) proven techniques for its study.
5. Diversity of program sponsorship and lack of a central contact point resulted in a "catch-as-catch-can" approach to building evaluation schemes. By the nature of the contract, we were compelled to work with existing programs--not having resources to develop our own. Only slowly did we begin to develop influence on

the structure and content of those programs we attempted to evaluate.

6. In many cases, evaluation was "after the fact" or "tacked on" like an appendage rather than being an integral part of the program planning itself. Nearly all the evaluation approaches we suggested required some type of adjustment in the already existing program plans.
7. No proven model exists for evaluation of curriculum, especially in the area of adult education. The contract was not designed to develop such a model and what curriculum evaluation schemes were available to us were not immediately applicable to the continuing medical education programs as evaluated.
8. The acceptance of only part of our evaluation program and design by those responsible for the continuing education programs threatened to jeopardize entire evaluations at times. Partly as a result of lack of total acceptance and partly as a result of working with intact groups, it is impossible to generalize many of our findings beyond the populations in the study.
9. Seemingly limited techniques exist for assessing physicians' needs except on an individual inventory basis. Many of these needs seem to be specific to a given specialty, a given geographic, or a socio-economic area. Thus, a need of one may not be a need of another--even in the same specialty because of the nature of his practice, the uniqueness of his patient population and his own priorities. In general, these individualized inventories have been applied on the self-appraisal basis. Exceptions to such approaches do exist,

witness Slye, Williamson, Brown, White, and other audit studies. In our region, audit approaches have not yet found acceptance and, thus, were not available in assisting in realistic determinations of continuing educational needs.

Despite the aforementioned problem areas--none of which ought be minimized--we remain convinced that the fortuitous combinations of personal and professional acquaintances in our region served to mitigate many of the inherent limits and to negate others which might have developed.

RECOMMENDATIONS:

We feel certain recommendations are warranted, but purposefully have not chosen to rank them in order of our personal priorities.

1. Neither cost nor geographic location seems to be a factor in leavening physicians' attendance at continuing medical education courses, but rather it is the factor of their perception of time away from the office and the lack of personnel to cover their practices during their absences; consequently, ways need to be developed whereby the physician can have access to the training necessary in his own area for shorter durations of time more convenient to his way of practice. This may well mean a renewed emphasis on providing such educational programs within the hospitals themselves. As indicated from the findings of this study, nearly 40 per cent of the hospitals in the state of Washington make no provision for keeping their physicians updated.
2. A centralized clearing-house for specialty areas may provide a

mechanism for dissemination of pertinent information to physicians throughout the nation. The evidence from this study clearly indicates however, that, if journals are to be a viable means of continuing medical education, improvements must be incorporated that will attract physicians to them as a source for continuing their development in the area of knowledge and skills.

3. More emphasis should be placed on and greater attention should be given to the promotional aspect of continuing medical education programs to develop attractive program topics, and to stress unique teaching techniques to be incorporated in a given program. Physicians appear to be influenced by title topics which indicate the relevance of the course content to their particular interests and needs.
4. In a few instances, the community colleges have been used to advantage in developing and administering continuing medical education programs; this resource should be developed to a much greater extent. It is a flexible institution with great potential as a resource for continuing medical education in the state.
5. A more in-depth study of physician educational needs should be pursued in specifically defined areas. It is further suggested that a mechanism be developed whereby these needs can be substantiated.
6. The financial base needs to be broadened in order to add additional staff in the Division of Continuing Medical Education to develop programs for allied health personnel as well as assistance to the director in the identification of needs, program development, and program administration.

7. Continuing medical education should, in fact, be a continuous process. The attitude toward this process must be planned for and developed as part of the undergraduate training. Continuous education should be built into the lifelong pattern of the study of medicine, which might well include periodical reassessments of physician's ability to continue in practice.
8. From the findings of this study, it is quite apparent that we must use the various media at our disposal to bring educational activities to the physician.
9. The design and management of the learning experiences should incorporate basic learning principles relevant to adult education.
10. There is need for further research to clarify some of the unanswered questions about the management of learning for adults.
11. When programs are to be evaluated, the evaluation design should be built in from the inception of the program and be an integral part of the total program, not an afterthought.

IMPLICATION OF STUDY:

The following points provide brief highlights of the immediate on-the-scene implications of the contract:

1. Continuing medical education programs have been evaluated in greater depth than at any time prior to contract.
2. Problem areas have been brought above the surface and are being wrestled with.
3. Continuing medical education programs in Washington are changing

with emphasis on more locally initiated, individualized programs, and use of additional media such as television and radio.

4. Interest has been stimulated in continuing medical education as evidenced by Community Coordinators, locally initiated programs, and willingness to assist in feedback efforts.
5. Entrance of educational psychologists in the area of planning, developing, and evaluating health science programs has been accepted.
6. Unparalleled cooperative and coordinative efforts are being made between physicians, educators, and medical academicians as well as between the University of Washington Medical School, Washington/Alaska Regional Medical Program, and the Washington State Medical Association.
7. The School of Medicine has shown, by substantial financial support for the Office of Research in Medical Education, its commitment to teaching and learning. This support adds stability to the Office as a long-range resource for continuing medical education in the Northwest.
8. The Project Director, William O. Robertson, M.D., and our consultant, John Lein, M.D. are now serving as the liaison between the School of Medicine, Washington State Medical Association, the Washington/Alaska Regional Medical Program and many other groups throughout the community. Their relationships among these institutions and organizations will enhance future cooperative continuing medical

education efforts in this area. "We talk out and not around our problems"--and formulate our collective solutions.

Two points ought be amplified. First, this contract has been the primary stimulus for the development of an Office of Research in Medical Education to focus on continuing as well as undergraduate and graduate education.

Historically, in September of 1967, an Office of Research in Medical Education was formally established in the School of Medicine at the University of Washington. For several years prior to this time, the ground work was being done primarily through the efforts of Dr. W. O. Robertson, Associate Dean, and a faculty Research in Medical Education Committee. A letter to the Dean specifying the assumptions, objectives, potential activities, and implications of such an office clearly indicates the breadth and depth of the scope of this concept as early as 1964 (see Appendix A).

The two-year period of development of both purpose and function of this Office has fortunately received outstanding support from faculty and administration alike, which has kept growing pains to a minimum. Up to the present time, a contract with the Public Health Service and a grant from the National Fund for Medical Education has provided the main financial support for the staff and activities of the Office. The support from these two sources during the ensuing critical years is now being substantially assumed by the School of Medicine.

Initially, the main efforts of the staff, comprised of Charles W. Dohner, Ph.D., Director, secretary, and two half-time research assistants, have been in pursuit of Public Health Service contractual objectives. Concurrently, the faculty has made considerable use of the staff as they have struggled with improving the teaching and learning process. These activities have included school-wide and departmental curriculum development and evaluation; conducting faculty seminars in educational problems; consulting with individual faculty members; and serving on a variety of faculty committees. The first Annual Report of the Office activities is in Appendix B. The demands being placed on the Office reflect an increasing involvement with the faculty and faculty committees in pursuit of answers to questions related to curriculum, teaching, and learning. The Office functions as an institutional resource for information, consultation, advice, and assistance to be offered, not forced. The objectives for this Office, as recorded in the Annual Report, encompass the total educational program of the School.

The efforts of the staff are being expanded in the area of continuing medical education by providing evaluation services for local Regional Medical Program educational projects and assistance to the Division of Continuing Medical Education within the School and continuing medical education endeavors throughout the region. Several seminars and workshops are being planned for the coming year centering on educational planning and evaluation for project directors and community coordinators of continuing medical education programs. Some of these programs will be made available to individuals throughout the Pacific Northwest.

Secondly, as a consequence of the contract and as noted repeatedly during the pursuit of this study--emphasized by such individuals as Sir Theodore Fox, Vandevere Busch, and Peter Woodford--the actual role of medical journals in continuing medical education differs to a considerable extent from their potential one. But even the actual role proves critical and basic for most physicians' continuing medical education efforts. The challenge then exists to develop modifications of medical journals--format, style, or content--to maximize their potentials or possibly to "imprint" medical students to react differently to them. To that end, we are attempting to undertake a rather detailed study of consumer-physician reactions as well as professional opinions--drawn from the field of journalism--regarding the existent national and speciality medical journals. We would propose to develop programs to build on their strengths and minimize their deficiencies. Such would be pursued on the assumption that the resultant changes would lead to favorable reception by consumer-physicians and more effective opportunities for learning on the part of physician-suscribers throughout the region. It would also be our premise that the generic model developed under this approach could be translated into action in other regions of the country were such considered desirable. We feel this avenue of investigation is long overdue.

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APPENDIX A

September 30, 1964

Dr. John R. Hogness, Dean
School of Medicine

William O. Robertson, M.D.
Medical Director

Proposal re "Research in Medical Education"

As you know, over the past 10 years medical schools have been examining their educational functions - documenting, appraising, and evaluating them. Sparked by the A.A.M.C. and George Miller's group (Buffalo and Illinois), such programs are adding a dynamic and objective aspect to "teaching and learning" which permits this function of Medical Schools to achieve a competative status with the conventional "research and patient care" function - to the benefit of all concerned.

At present, several Departments in the School of Medicine have already undertaken analyses of their educational programs. An additional emphasis - on a school-wide basis would appear indicated. Toward that end - i.e. the implementation of a more formalized program of "Research in Medical Education". I would propose:

1. A number of assumptions be examined in terms of the likelihood of their being accepted - or at least not actively rejected - by the faculty and administration of the School of Medicine prior to the institution of any program. These include:

    a. That the complexities of the educational process are legion.

    b. That these complexities are an appropriate area for scientific investigation; proper investigation may provide either (or both) theoretical knowledge about, or practical approaches, to solving problems contained therein.

    c. That the educational process in medicine - undergraduate, postgraduate, and continuing - lends itself in an extraordinary fashion to study; appropriate study of it would affect, in a constructive manner, the medical school's success in its objective of providing optimal learning situations and experiences to all its students. (Moreover, as with patient care, the incorporation of a research program seems to improve overall function.)

    d. That, considering the total budget of the Medical School, a small percentage devoted to "Research and Development" of its product - successful learning - would seem appropriate.

As I see it, none of our faculty would oppose such assumptions and, I believe, all would favor developing a more formal program.

1. Time
2 Capita

2. Accepting these assumptions an Office or Division of Research in Medical Education might be formally established as a "staff" (as opposed to a "line") activity. Conceptually I'd see it as a Dean's Office related function but with participation by individual departmental members. Such would allow for school-wide studies as well as enhancing the effectiveness of intra-departmental activities.

3. The objectives of such a program would include:

   a. To serve as the stimulus for research in medical education.

   b. To provide a "service", or access to appropriate services or consultative services, for individual faculty members or to individual departments who wish to conduct intra-departmental investigations.

   c. To coordinate or assist in coordinating or to conduct school-wide or interdepartmental investigations.

   d. To assist in securing necessary funds for support of investigations.

   e. To provide or assemble appropriate data for committees such as the Curriculum Committee - which, in turn, would make them available as an objective basis for their deliberation.

   f. To provide a focal point for non-medical school University faculty members to turn should they be interested in the subject of medical education. At the same time such a program would provide an avenue of rapport for medical school faculty members with those in education, psychology, sociology, economics, engineering, mathematics, etc. and allow mutual assistance in the planning and conducting of any cooperative investigation involving both groups.

   g. To work with ancillary services - such as Audio Visual Educational Services - in furthering the investigation of their success in achieving their objectives.

   h. To assist in the assessment of new programs, or innovations in the curriculum.

   i. To assist the School of Medicine as it gropes with the immense problems of both graduate and continuing education.

   j. To further the development of optimal learning situation in the medical school setting.

COPY FROM DEAN'S SCHOOL MEDICINE

4. To implement such a program the following steps would seem in order:

   a. Designation of a responsible individual on a temporary or permanent basis.

   b. Establishment of liason with non-Medical School University Faculty. This has proven of enormous value to successful programs elsewhere.

   c. Announcement of the program to medical school faculty and student body.

   d. Appointment of an Advisory Committee representing the School of Medicine faculty - which would meet with an open door policy.

   e. Cataloging of studies of medical education already in progress.

   f. Inventorying of individual faculty members and departmental interests.

   g. Developing - in the light of such factors as faculty interest, geographic location, physical facilities, etc. - the existence of potential avenues of investigation at different educational levels which would appear most promising. These levels would include:

      1. Pre medical education.

      2. Undergraduate medical education

      3. Research training programs

      4. Internship programs.

      5. Residency programs.

      6. Fellowship and post-doctoral programs.

      7. Continuing medical education programs.

      8. Para-medical programs.

   h. Among areas likely to be fruitful in initial studies the following would seem ripe for investigation:

      1. An assessment of the significance of social-cultural background factors as these appear to influence undergraduate student attitudes, performance, and goals of the University of Washington.

2. An appraisal of the importance of modifiable detractors - "noise" - in interfering with optimal learning on the part of undergraduate and postgraduate students.

3. An assessment of the impact of medical journal communications on the "postgraduate learning" of practicing physicians. (Despite a burgeoning 14,000 published annually, as of 1962 only 82 studies have been made in this area - with 79 directed solely at the impact of advertising therein!)

4. The construction of a theoretical and modifiable model representing the dynamics of a successful "rounds".

5. Time and motion studies of appropriate learning situations. Additional points could be listed; their listing, I feel, should await broader faculty involvement. (As is evident at Illinois, the faculty itself must be heavily involved in such planning or the program may fail for lack of interest - or presence of threat.)

6. An analysis of written and verbal communications in medicine.

7. An appraisal of programmed learning, T.V., etc., as these techniques develop.

5. On a more practical level, the following schedule might be appropriate:

   a. Further discussion with non-medical school faculty at the University of their potential interest in such a program and their willingness to provide consultative advice as well as their possible participation. This aspect cannot be emphasized too strongly; were the College of Education to be interested in becoming involved, I feel the School of Medicine must be prepared to provide appropriate support. Nevertheless, such involvement must at no time minimize the primary need of active participation by School of Medicine Faculty; to be dynamic in its effect such is crucial.

   b. The formulization of the program so that a preliminary announcement might be made to the Faculty - such might be concurrent with Jack Lien's arrival.

   c. The appointment of a small (rather than a large) "Advisory Committee" with members assuming, at least initially, responsibility for providing feedback to departments other than their own. Perhaps five or six non-departmental chairman would suffice; such would best be able to develop a seminar format for 3-6 months as the program began.

d. The cataloging of studies currently in progress to be undertaken shortly after formulization.

e. The approaching of representative foundations for "funding" of investigations should also be undertaken shortly after formulization.

6. To get the program off the ground, we have space; I'd anticipate we'd probably require some additional secretarial services within three months of initiation.

In summary, I'd see a more active program in Research in Medical Education not simply adding to knowledge but equally importantly serving as a needed stimulation of the teaching function of the School of Medicine. I would hope you concur.

Sincerely,

William O. Robertson, M.D.
Medical Director

WOR:ame

"white copy" sent to Gordon C. Lee, Dean
210 Miller

APPENDIX B

COMPUTER-AIDED INSTRUCTION IN HEART, CANCER, STROKE, AND RELATED DISEASES

This project itself was carried out under the aegis of the Washington/Alaska Regional Medical Program. Its purpose was to develop and then evaluate computer-aided instruction (CAI) as a complementary and supplementary method of continuing education for physicians, nurses, technicians, and other health personnel. The project was directed by Mr. Don Miller, Project Coordinator, who developed and supervised the production and the implementation of nine CAI programs during the first year. These programs are: "Arterial Fibrillation," "Arterial Flutter," "Bradycardia," "Introduction to ECG's," "Malignant Melanoma," "Renal Function in Pregnancy," "Renal Hypertension," "Review of Arrhythmias," and "Tachycardia."

Our office staff, supported by this Contract, assisted Mr. Miller in the project evaluation. The following is a synopsis of the field evaluation as prepared by Mr. Miller. The communities of Aberdeen, Port Angeles, Port Townsend and Anacortes, Washington, were selected on the basis of their willingness to cooperate and their remoteness from Seattle. Duration of availability of equipment was determined by the number of physicians in the community and computer time available. Users were informed that they could use the system on weekends by special arrangement, or late in the evenings, if they let the computer operator know what time. Before the equipment was left in each community, it was demonstrated and a "hands on" experience was made available.

Instruction sheets were left along with the phone numbers of where help was available if trouble developed.

Evaluation information was collected as soon as possible after the equipment was moved from a given city. In Aberdeen and Port Townsend, evaluation meetings were added to the agenda of pre-scheduled conferences. These communities provided the most feedback because most of the participating physicians were there. Dr. Charles W. Dohner from the Office of Research in Medical Education and Mr. Miller attended all evaluation sessions and collected verbal comments at the meetings and also responses to a questionnaire.

In general, satisfaction was expressed in use of the system when it was functioning properly. The greatest hindrance to the machine's use was seen as being the time of day that it was available. Data supplied by Mr. Miller indicated that the more times a day a system can be used, the more it is used.

Evaluation Field Trials

Attached is a form with the categorical items summarized (Table 1). The open-ended responses are summarized below.

Question 1: What operational difficulties, if any, did you experience?

In general, all who reported use of the system expressed their enjoyment in its use, as long as it was functioning properly. However, failures were most frustrating. It was very difficult to contact the computer room, especially at night. Failure seemed to be caused by a variety of sources--terminal operation ignorance, computer-operator error (i.e., pulling disc in middle of run), phone company ignorance, instructional program errors, computer failure, slide projector jams, and electro-mechanical failure of the terminal. In short, just about anything that could have happened did happen, at least once.

It was expressed that, after a long day, the physician or nurse is tired and that light material or humor is essential to keep up the human machine dialogue. The greatest hindrance to the use of CAI was the time of day it was available. The more times a day the system can be used, the more it is used. To support this, figures from Aberdeen and Anacortes are presented (Table 2 attached).

Also the users found it difficult to be at the machine within the 15-minute window that was available to them. If they didn't start within 15 minutes of their scheduled time, the computer operator assumed they were not going to make it and started a "batch" process. Other problems were identified, such as a need for better labelling of slides, better identification of trays, and some of the loops designed for review did not answer questions needed to be answered. It was expressed that the CAI was especially effective in causing the learner to be actively involved in the learning process. The material level seemed appropriate for most of the programs. They also indicated that a wider variety of programs would have been advantageous. This, of course, is a little difficult at this time when only nine programs have been developed.

Some of the other advantages mentioned were: they did not have to expose their ignorance and could still learn; the typed-out answers to take home were good; a variety of difficulty of questions was presented;

the pressure of one-hour limitation gave them a sense of urgency. In general, satisfaction was expressed in the use of the system when it was functioning properly.

Question 2: What other program, if any, would you like to have on CAI?

The response to this question seemed to be related to personal interest and no trend could be established.

No. of Requests	Program
3	Drugs Used in CCU
2	Fluid Balance
1	Childhood Diseases
1	Skin Conditions
1	Respiratory Treatment (use of O_2 tent)
1	Shock and Patient Treatment
1	Endocrinology
3	Acid Base Balance

Other requests were for a more diversified use such as a diagnostic aid; handling a physician's medical records (and medical history acquisition) and patient instruction.

Participants' Suggestions for Future Field Operations:

1. That there be another phone line to the computer room.
2. That all odd computer times be made available (i.e., between 12:00 and 1:00 p.m., 5:00 and 7:00 p.m., and may as well go on until 9:00 p.m. since the regular start was 7:30 p.m. After midnight, it may as well be left on for use in the early morning hours by nurses, etc. who are up then).
3. That data sets be used at both ends to cut phone costs and ease

difficulties in getting coupled up. Perhaps a plastic dial card would facilitate this operation. This was one of the most consistent troubles.

4. Leave a stand-by terminal in the field as a back-up.
5. Remount all slides in plastic (now under way).
6. Have demonstration and evaluations as part of regularly scheduled meetings.
7. Since the feedback to the system is the primary route to improvement, the validity and reliability of returning information is critical. The quality of this information can be enhanced greatly by additional programming. Three cases of information need this attention.
    a. Timing: when the program was taken and how long it took.
    b. All the information on the present questionnaire.
    c. Educational strategy sophistication.
    d. Need error count form.
    e. Need error count individual error pattern through program.
    f. Need latency form for end of print to response.
    g. Spaced review.
    h. Ability to print error ratio on individual request.
    i. Program to detect legality of CAI addresses.
    j. Program to prevent the election of an invalid frame number from killing the system.

The second part of our office's involvement with this project was the evaluation of the use of CAI with undergraduate medical students and nurses. The Office helped to develop and analyze equivalent forms of examinations to be used in pre- and post-testing utilizing an analysis of variance design to measure the amount of knowledge gained as well as to compare the CAI quantity of knowledge with programmed instruction and traditional classroom lecture method. Four of the CAI programs were selected to be used in the study of comparison gain in knowledge with second-, third-, and fourth-year medical students and nurses. These four programs are as follows: 1) Malignant Melanoma, 2) Renal Function in Pregnancy, 3) Renal Hypertension, and 4) Introduction to ECG's.

Problems arose related to the administrative aspect of these particular programs with the result that analyzable information was available only from the "Renal Function in Pregnancy" program. However, an additional study using a "Malignant Melanoma" program was carried out later in the spring under the direction of Dr. John M. Short, Assistant Professor, Department of Medicine. This office also participated in evaluation of that program.

Student Evaluation:

Medical students were used to collect information on the relative merits of lecture, programmed instruction, and CAI because it was hypothesized that students would afford a more controlled situation than practicing health care professionals. These are the same students who provided a testing ground to improve the materials.

The first group of students was taken from the conjoint course, 454. Thirty-four examinations and comment sheets were returned from the lecture group, 12 from the group that had computer-assisted instruction and programmed instruction, and 10 from the group that had programmed instruction only. The reason for overlap between PI and CAI for the one group was that each student was limited to one-half hour on the computer terminal. Table 3 attached is a summary of the returned questionnaire.

There were several notes on the questionnaire showing the desire for more personalized learning situations such as a combination of the media involved. The results of the questionnaire indicate that the students in the lecture method were more satisfied with the material and methods than the students on CAI and PI for this particular experience. Nevertheless, all groups wanted more CAI and PI but fewer and better lectures. Because of a limited number of students involved in CAI and PI and just PI categories, test significance for mean error levels would be meaningless; nevertheless, on the face of it, there did not seem to be much difference in mean error levels. Another problem was that the test had a very low "ceiling" and thus several persons got the entire examination correct.

The results of the two courses, "Renal Function in Pregnancy" and "Malignant Melanoma," that were anlyzed by this Office are summated on Tables 4 and 5, attached. The reliability for the equivalent forms tests used in the "Renal Function in Pregnancy" study was .60. For Dr. Short's program, the post-test consisted of the pretest plus 25 additional items. Reliability of these two instruments was .17. As shown in the tables, there were no significant main effects and the F ratios were non-significant. Thus, the null hypothesis was not rejected for either study. In addition, there were no significant differences for time factors in the Regional Medical Program study. These results concur with available studies in educational research (Stern, 1963; McKeachie, 1963).

For the program, "Malignant Melanoma," the second-year medical students were assigned randomly to three sections. The same program was presented in three different modes of instruction--CAI, PI, and "traditional lecture." The final number of students in each section was 25, 24, and 31 in CAI, PI, and lecture, respectively, due to program changes. Information was collected regarding the student's attitude toward these three instructional media. 1) The students were asked to indicate an overall quality of the program by rating it on a scale from "poor" to "excellent"; 2) the preference for various modes of instruction was determined by asking them to rank the media used in order of their preference as a means of instruction from lowest to highest; and 3) the attention value of these three modes was determined by asking the students to rate them on a scale from "no attention" to "excellent attention value."

In a previous unpublished study by Dohner and Hamberg, "Selected Characteristics of Medical School Students at the University of Washington," programmed instruction was rated as most preferred when students were asked to compare various media that they had previously used prior to entering medical school. Programmed instruction, filmed instruction, taped instruction, television instruction, and computer-aided instruction were rated in that order. The percentage of students who had had experience with these various media are as follows: filmed instruction (99 per cent), taped instruction (85 per cent), programmed instruction (58 per cent), television instruction (53 per cent), and computer-aided instruction (17 per cent). It is not clear if these ratings are the result of novelty of the various media or of satisfaction or some other variable. It is interesting, however, that programmed instruction, while third in familiarity, ranked first with regard to preference for those using it and that television instruction ranked next to last.

Based upon these findings, it could be hypothesized that programmed instruction would receive higher ratings in terms of preference than either CAI or lecture method. It would be of interest also to see if PI were rated highest using other concept variables. Subsequently, the following hypotheses relating to these three modes of instruction were set forth.

HYPOTHESIS 1: There is no difference in the overall quality rating by students between the CAI, PI, and lecture modes of instruction that they respectively experienced.

HYPOTHESIS 2: There is no difference in students' preference ratings between the modes regardless of which mode was experienced.

HYPOTHESIS 3: There is no difference in student preference ratings between the respective modes experienced by the students.

HYPOTHESIS 4: There is no difference in the attention value ratings between the respective modes experienced by the students.

The students were asked 1) to give an overall quality rating of the program, 2) to rank the media in order of their preferences as means of instruction, and 3) to indicate the extent to which the program kept their attention. All of these ratings were based on a rating scale from 0 to 4, with 0 being the lowest and 4 the highest rating. Mean ratings were determined for each of the instructional groups and comparisons were made between the means of the various instructional modes. The statistical significance and mean differences on these responses between CAI and PI, CAI and lecture, PI and lecture in each of the groups was evaluated by means of t ratios.

Table 6 presents an analysis of the mean differences between the groups on the attitudinal responses. The lecture method received the highest overall quality rating of 3.00. The first null hypothesis is rejected ($p < .05$) when comparing PI or CAI with lecture. The lecture method is found to have a significantly higher quality rating than either. There was no significant difference in the overall quality ratings between CAI and PI.

In order to test the second null hypothesis, the means of the preference ratings for the three modes as instructional media were computed across all students. A significant difference ($p < .05$) in preference ratings was found between CAI and lecture method with the lecture method receiving the highest preference rating. There was no difference in preference found between CAI and PI or between PI and lecture.

The data relating to the third null hypothesis are found in Table 7. With the exception of two comparisons made by those in the PI section, no differences were found in students' ratings of the three modes as a means of instructional media. The results show that the students in the PI section rated the lecture method higher than CAI, and PI higher than CAI. This type of discrimination did not appear in the CAI or lecture group.

The fourth null hypothesis set forth is not rejected. None of the mean differences in students' ratings of the attention value of these programs is statistically significant. Based on these data, there is no evidence to suggest that a difference in attention value among these three modes of instruction exist, at least for the population in this study.

Comments from those students in CAI mode:

The CAI would be better at holding attention if there were sound available also.

Each question tends to be a discreet entity and a good deal of proactive and retroactive inhibition is in effect. Noise.

It could be that cramming for finals all day has made my attention span very limited, but whatever it was, I was unable to really concentrate on the program. (The time of day might be very important.) Having had no prior experience with a program of this nature, I found the computer completely overwhelming and hard to concentrate on. I would be interested to see if a second exposure would be more profitable.

I like the ability to be an active participant in my learning.

I will be better able to evaluate it after several weeks or months when I see how much I forget!

One trouble with this type of learning is that the student is left with no concise material for study at a later date as one would have from class notes. A tremendous improvement would be an outline of the material to be received after the CAI. The time I really learn material is not on first presentation, but on later review.

The ending was rather unclear--would be better to be informed that the end has come.

The program is good--as a variation from usual methods of learning. The variation of methodology is effective in keeping one's attention.

Fun! But a second try at it would be helpful--but might break your pocketbook.

Typewriter was distracting. Questions seemed lacking? One isn't able to look back to refresh while taking CAI--as one could with PI.

Interesting but seems to jump around--no smooth transition in points.

No.

I think that a person certainly must be in the right frame of mind when he takes this program. Otherwise, it could be very confusing. Also, the knowledge gained from such a program requires rather intense concentration if any of it is to be remembered. This is difficult due to several problems including 1) noise of output typewriter, 2) inability to go back to previously done questions for personal (rather than programmed) review. Of course, this type of learning does not permit questions or any in-depth probing of any subject introduced. (This can be done in lectures, texts, seminars.) The slides presented were difficult to view due to lighting, angle of projector and general inconvenience of changing slides.

I found the program easy to follow, but found I could not recall much of the detail required by the test.

Yes, finally you asked. I got to the pink sheets and thought, "Ah hah! Now I am going to get to say something." But no--all I get are "circle the number, check the box, mark your preference."

The computer I was uncomfortable with. This may go away with use. The typewriter is very hard to concentrate around. On the whole, the program was not very interestingly written. By far most significant for me, however, was the lack of opportunity to feedback more than one flick of a finger. Believe it or not, I do think during lectures and while I am reading. And I get a chance to write something that comes from my regurgitation circuit. Here I haven't felt rewarded significantly. The test was comprehensive but I kept thinking, "This is an awful big favor I am doing," because it just dragged along.

Several of the questions were vague and/or presupposed a prior knowledge that was not given in the program. The inevitable delay of typing also caused a loss of attention that is undesirable. Also, some of the questions are entirely too simple.

As an overall effort, however, you are to be congratulated for at least trying something new.

Good potential in some areas. For topics that involve clinical observations and differentials that can be confusing, I question the use of it. I find also myself doing the mechanics of the program but retaining actively very little. I think a seminar with slides both histo. and clinically in small groups is the only way in dermatology.

Although the technique is interesting, once I left the computer I felt I had little knowledge of the subject.

My feeling about learning is that to learn best and fastest, and to retain that knowledge, a person needs to use all his available senses (hearing, seeing, feeling, smelling). The impression in this way has to be greater. The computer program seems to eliminate most of these impressions and makes the experience mechanical and transient.

Comments from those students in PI mode:

I thought one of the objectives of a programmed text was to allow each individual to proceed at his own rate; whereas I sat so long waiting for the slides to change that I forgot the material I had read. By the time I finally got to the post-test, it was basically just another guessing game.

My case is perhaps teaching new math to an old math mind: I have a good deal of trouble consolidating the programmed material.

It did not seem to flow naturally. Many times one just fell into the next frame--a logical development was not felt to be present throughout.

The programmed text was not completely explained at first (how to determine which box to go to next?). But after it was explained it was easy to follow. I probably would have gotten even more out of the program by taking a little longer to absorb the material in each case. Once a student is more used to this type of instruction, his time will be more productive and he can proceed at his own rate.

Once over the material is insufficient.

You should be more careful to give instructions on how to answer the questions, i.e., how to read the answers. Also it might help to point out a few representative things on the correct slides--after we have chosen one or the other--it is possible to guess the correct slide of two not so clear slides and not know why it is right.

It would be considerably improved with adequate projection and with a typed summary of signs, symptoms, treatment and prognosis of each disease placed at the end of instruction.

The instruction should have been reworked.

Programmed instruction needs some drastic improvements.

I felt rushed.

Fairly well-organized and instructive.

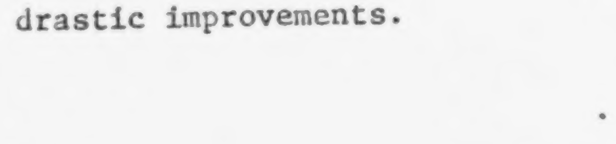
I find PI done at my own pace an extremely efficient way to learn. This program was not beneficial for me because of the forced rate to keep up with the slides.

Not enough time. Can't work at your own pace because of the slides. Would be great for self-teaching.

I do not feel relaxed or as if I enjoyed this last two hours. I do feel seminar accompanied by slides and with syllabus would be more advantageous. I would prefer to be given the program text to do on my own at my convenience.

In devising the program I feel that mere sequential ordering of questions does not provide enough recall from the student. In devising this program I would have put in come comprehensive questions at the end of each pathological entity.

Subject
Sequence question
Comprehensive question



I had trouble evaluating the program per se because I dislike program texts so much. I would much prefer to have the same material presented in 1/5 the space, memorize some definitions and characteristics, see some pictures, and leave the subject for a while before returning to it to relearn it. My retention following the use of a program text is minimal plus I have not had adequate chance to compare various aspects of the subject so that I do not develop a good perspective on the subject. I would spend my time writing a clear, concise, well-organized syllabus (which the Dermatology staff has already done) rather than a programmed text.

It would be more effective for me if there were more review questions throughout the program. Otherwise, one might as well read it in a book.

At first, the directions of how to get from one frame to the next in the programmed text were unclear. I prefer to read the material and take notes on it at my own speed in a text to a programmed text. I don't like learning under pressure of any sort.

I don't feel I had time to really learn it. Because of the slides, you had to stay with the group and couln't think things over at your own speed.

1) Original instructions on how to proceed were obviously unclear. However, once explained, the program was easy to follow.
2) Each individual needs his own slides to facilitate immediate reviewing, comparison, and to allow this to be an independent learning experience that each student can adjust to his particular pace and mode of learning.
3) In statements that list criteria in sentence form, I find it difficult to see and remember these criteria. My feeling is that it would be a quicker method of visualizing and learning criteria if they were listed in outline form, e.g.

   Early lentigo maligna...
      1) has atypical cells
      2) appear only at dermo-epidermal junction
      3) do not invade dermis
      4) inflammatory infiltrate sometimes

   Keep up the effort for improved learning techniques--very very tired of poor lectures.

It was a good program. After reading through it there should have been discussion (seminar) before taking exam.

As an experiment, this course has been interesting; certainly it breaks the monotony of a lecture schedule. If the programmed instruction is continued to be used, I would suggest an improvement in the logical flow. I have the feeling that some lesions have floated past without a definite concept of them. I would like to have been able to have an instructor clarify some of the descriptions and distinctions for me.

I found that the exam asked for fine distinctions which were not apparent to me in the program.

Comments from those students in lecture mode:

Some of the questions on the test were not mentioned in the lecture.

The enthusiasm of the instructors stimulated my interest (and attention) in and to the material covered thus far.

The lecture seemed too much like a computer course. It presented questions that the ordinary lecture doesn't--which is the main problem of the ordinary lecture, e.g., you would show a slide of junctional nevus several times to reinforce it, whereas ordinarily the slides would be all in one slug and not integrated among others to contrast.

Dr. Sagebiel's presentations are lucid, concise and a pleasure to attend.

I thought I knew the material from the lecture before the test--but the lecture was either not complete or the test covered superfluous material.

It was a headache to answer all the questions, otherwise OK.

From the practical point of view, programmed instruction (paper and pencil) with carrousels to show visual examples seems to be the best approach.

In essence, I feel lectures are a waste of time. The reason the average student likes this is that he is told what is important and it takes less work than reading vast textbooks trying to sort out what is relevant. If he were first directed to pertinent material and then shown clinical or slide material to reinforce major concepts in small seminars it would be an improvement of this lousy spitback rote memory system.

The efforts of the Dermatology staff are appreciated.

I like the way the lectures on the first day were broken up. I think that it is much better to have 15-20 minutes from one lecturer and then change. This offers two main advantages:

1) Lecturer doesn't have time to ramble; lecture must be short, organized and concise.

2) Student doesn't have time to go to sleep.

So far program is great.

The "programmed instruction" was written confusingly--it takes longer to figure out directions than learn the material. The slides were difficult or impossible to see. My past experience indicates that this is the slowest means of learning I have ever attempted and in this case my anger at the above circumstances made it impossible.

A good lecture is a tremendous learning experience. Most lectures, however, are given, it seems, by someone who would rather be doing something else.

The sheer number of lectures is a disadvantage. It's hard to consistently maintain interest in any single teaching method. A variety is needed.

Future Planning:

There seems to be a sufficient amount of enthusiasm among physicians and students to want continued work in this area. Future evaluation of CAI programs should involve closer work with the evaluation area in the development of the programs themselves in terms of objectives with the development of the instruments in order to build instruments that possess higher reliability for evaluational purposes and in the actual implementation of the design after the selection. Cooperation of all parties involved must be secured long in advance of the implementation of the program.

Discussion:

The results of our evaluation lead us to suggest that there is probably going to be no real difference in the amount of knowledge gained when different methods are used and that any valuable differences will be dependent on other factors, such as time involved, convenience, efficiency, and cost. However, there still remain many variables that certainly were not controlled for or examined by this study, such as the effect of different levels of I.Q. and times of day, levels of branching, sophistication, etc. If one simply views the CAI method in terms of its ability to teach an amount, i.e., quantity of information, results of our evaluation confirm that it functions in this manner as well as programmed instruction per se and the "traditional" lecture method.

The fact that no difference was found between CAI and PI in either quality or preference ratings is in contrast to the study of first-year medical students at the University of Washington (1968) when PI received the highest preference rating among various media, including CAI. It could be hypothesized that the two groups are from different populations, or that the quality of the PI and CAI programs contributed significantly to the apparent shift. We did not test this hypothesis. It has been quite popular recently to deplore the lecture method as an outdated and ineffective means of disseminating knowledge, even to the extent of suggesting it be completely eliminated in some cases. However, the analysis of the data in this study tends to support the lecture method in both quality and preference, at least for the topic, "Malignant Melanoma." This is a reversal of the expectation that programmed instruction material would have been preferred. But, again, this phenomenon may be due to experience and familiarity with the method. It is also of interest to find that students did not feel any differences in the attention value among the media. Apparently, even the novelty of the new approaches to teaching had little influence on student attitudes toward them, although we did not test this hypothesis, *per se*.

The only significant differences found in student comparisons of the three modes was in the PI group where CAI was found to receive significantly lower ratings than PI or lecture. No other clear distinction was found which suggests there may not be any clear pattern of preference among the instructional media used in this study. Other studies (McKeachie, 1960; Koenig et al, 1959) find that methodology does not affect learning.

Based on these findings, there is little evidence to suggest that students will learn more effectively or that they are likely to be more highly motivated with any one medium. The quality of the program or the topic to be presented may, in the final analysis, be more important in deciding which medium to use as well as the medium itself. The instructional media have no inherent magic in and of themselves to enhance the learning environment.

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TABLE 1

W/ARMP CAI PROJECT
Evaluation of Field Area Demonstration

1. For each program you started to view check if you completed it, if not check reason for not completing it.

Program	Completed	Reason for not Completing Time Ran Out	Equipment Failure	Dissatisfied	Other
1. Atrial Fibrillation	10	1	3	BAD TIMING	
2. Atrial Flutter	10	1			
3. Bradycardia	15	1			
4. Introduction to ECG's	16				
5. Malignant Melanoma	1	2	1		1-FATIGUE
6. Renal Function in Pregnancy	1		1	1	1
7. Renal Hypertension	2		1		1
8. Review of Arrhythmias	17		7		
9. Tachycardia	12		3		2-PROGRAM ERROR
TOTAL:	84	5	16	1	5

TABLE 1 (continued)

2. For each program you viewed either completely or partially, check whether the content was primarily new or review material.

Program	New Material	Review Material
1. Atrial Fibrillation		11
2. Atrial Flutter	1	10
3. Bradycardia		14
4. Introduction to ECG's	1	15
5. Malignant Melanoma		3
6. Renal Function in Pregnancy	1	2
7. Renal Hypertension	2	2
8. Review of Arrhythmias	4	14
9. Tachycardia	3	14
TOTAL:	12	81

3. Please rate the program you viewed.

Program	Very Valuable	of Some Value	of Little Value	of No Value
1. Atrial Fibrillation	5	7		
2. Atrial Flutter	5	6		
3. Bradycardia	6	6	1	
4. Introduction to ECG's	7	7	2	
5. Malignant Melanoma		2		
6. Renal Function in Pregnancy	1	2		
7. Renal Hypertension	4			
8. Review of Arrhythmias	13	7		
9. Tachycardia	9	5	1-PROGRAM FAILURE	
TOTAL:	50	43	4	

TABLE 2

PHYSICIAN RESPONSE FROM TWO CITIES

COMMUNITY	PHYSICIANS IN COMMUNITY	DAYS IN COMMUNITY	HOURS USED	NUMBER OF TIMES AVAILABLE PER DAY
Aberdeen	22	25	20	7:30-8:30
Anacortes	7	6	50	7:30-8:30 plus time requested from limited periods of availability.

TABLE 3

STUDENT RESPONSE TO CAI IN CONJOINT COURSE 454, LABORATORY PROCEDURES

	LECTURE	CAI & PI	PI
Satisfied with material			
Yes	17	5	2
No	9	4	3
Satisfied with method			
Yes	21	7	5
No	15	4	4
Future role of CAI, PI and Lecture			
Lecture			
More	0	0	0
Less	9	2	2
CAI			
More	4	6	0
Less	0	0	0
PI			
More	6	6	4
Less	0	0	0

TABLE 4 Dr. John Short

MALIGNANT MELANOMA

source	df	SS	MS	F
treatments	2	29.485	14.74	0.916
error	63	1013.682	16.09	
total	65	1043.167		

N = 66

TABLE 5 Regional Medical Program

RENAL FUNCTION IN PREGNANCY

source	df	SS	MS	F
treatments	1	.05	.050	0.013
error	18	64.50	3.586	
total	19	64.55		

N = 20

TABLE 6

COMPARISON OF QUALITY, PREFERENCE AND ATTENTION VALUE BETWEEN THREE MODES OF INSTRUCTION AS SEEN BY SECOND-YEAR MEDICAL STUDENTS

Modes of Instruction	Overall Quality			Preference			Attention		
	Mean	t-ratio		Mean	t-ratio		Mean	t-ratio	
CAI (C)	2.44	C-P	1.30	1.8	C-P	1.86	2.64	C-P	.24
PI (P)	2.54	C-L	2.96**	2.1	C-L	2.61**	2.71	C-L	1.08
Lecture (L)	3.00	P-L	2.14**	2.2	P-L	.30	2.90	P-L	.95

* Mean computed across all students.

** $p < .05$

TABLE 7

COMPARISON OF STUDENT PREFERENCE FOR THREE MODES OF INSTRUCTION IN EACH OF THE THREE INSTRUCTIONAL GROUPS

Modes of Instruction	CAI GROUP			PI GROUP			LECTURE GROUP		
	Mean	t-ratio		Mean	t-ratio		Mean	t-ratio	
CAI (C)	2.0	C-P	.8655	1.4	C-P	2.997*	1.8	C-P	1.776
PI (P)	1.7	C-L	.5313	2.4	C-L	2.524**	2.3	C-L	.3611
Lecture (L)	2.2	P-L	1.444	2.3	P-L	.1402	2.1	P-L	.770

* $p < .01$

** $p < .02$

APPENDIX C

UNIVERSITY OF WASHINGTON
School of Medicine

EVALUATION REPORT
OF THE
CENTRAL WASHINGTON PROJECT

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THE CENTRAL WASHINGTON PROJECT

Outline

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In December of 1965, a committee of 30 physicians in the isolated area of Central Washington met to discuss the need and opportunities for continuing education of physicians and other health professionals in that area. After a number of meetings, this group initiated and completed a comprehensive survey of medical facilities and manpower resources in Central Washington. Most of the 240 physicians in the area participated in an attempt to identify their own continuing education needs.

These 240 physicians serve approximately 250,000 people and are isolated from any academic and medical facility by as much as 100 miles. There are nine small hospitals in communities within a radius of 100 miles of Yakima, the major city in this Central Washington area, whose staffs confer with the specialists in the Yakima medical community as frequently as time and distance will permit. No major professional society meetings are held in this area and physicians who wish to attend continuing education courses must travel 150 miles or more to Seattle, Portland or Spokane.

The content of the program took several forms, including exchange of teachers and practitioners between Seattle and Yakima, audio-visual programs, and the use of educational television. Visitation teams comprised of two physicians from the Seattle area spent two days in the city of Yakima in continuing education activities that were primarily directed toward physicians. Various topics determined by the Central Washington continuing education committees have been televised in a series of three shows, followed by a fourth meeting at which the instructors who made the television tapes visited Yakima for a two-hour wrap-up session during which a question-and-answer time provided opportunities for discussing pertinent points in the televised programs.

The over-all purpose of the project is to provide members of the Central Washington medical communities with opportunities for teaching and learning in order to improve the care for victims of heart, cancer, stroke and related diseases.

OBJECTIVES:

The specific objectives of the project are as follows:

1. To provide opportunities for teaching and learning which will improve care of victims of heart, cancer, stroke and related diseases.
2. To improve communications between the Seattle academic complex and the Yakima complex which will augment continuing education.
3. To improve communication between Yakima and the surrounding communities in ways which will augment continuing education.
4. To stimulate health practitioners to identify their own educational needs.
5. To investigate records or whatever pertinent data are available to substantiate needs or determine others.
6. To utilize personnel and facilities to gain maximum profit from hospital visits by Seattle academic personnel.
7. To design evaluation instruments which will reveal practitioner's progress toward goals.

8. To recreate habits of self-instruction.

9. To provide latest advances in the diagnosis, treatment and rehabilitation of victims of heart, cancer and stroke in the Central Washington area.

EVALUATION DESIGN:

The Office of Research in Medical Education at the University of Washington School of Medicine was asked to assist in the evaluation of this project. The first step was to identify the objectives of the program. These are listed above. Secondly, our staff proposed an evaluation scheme for measuring the degree to which these objectives were achieved. Some of the objectives had been accomplished prior to this invitation. Also, it was not possible, within the limitations of time and funds, to evaluate some of the project objectives.

The following is an outline of the evaluation proposal:

1. Attitude Change Measure

   A semantic differential was developed to assess any change of physician attitude during the course of study. Examples of relevant concepts to be used in this study were: televised learning, television, lecture, televised lecture, review material, research material, continuing medical education, and practical material. The research hypothesis was that there would be a significant change of physician attitude during this course of study.

2. Knowledge Gain Measure

   Three different designs were proposed to measure the amount of knowledge gained by participants who viewed the televised series. A pretest would be given to identify entry knowledge and a post-test was to be given at least 30 days after the last televised series in order to assess long-term gain in knowledge.

3. Change in Practice Measure

   The hospital records were to be examined prior to the series for patients whose final diagnosis for the admitting symptoms was known. Histories, tests and treatments ordered were to be recorded. The results were to be assigned scores based on the criteria established by the lecturers. The scores be[illegible] the television series and after the series would be compared. It was pr[illegible]ed that higher scores following the series would indicate practice [illegible]ges.

4. Communica[illegible] Evaluation

   It was felt that any increases in the frequencies of telephone calls, letters, personal visits or referral letters between the physicians in Yakima and selected medical professionals in the Seattle area could be interpreted as being related to the Central Washington Project.

5. Viewer Response

A brief questionnaire was to be sent to viewers and potential viewers of these programs in order to assess the attendance and attitude factors of those physicians from the Central Washington area.

A detailed proposed plan including the above areas was then presented to the Central Washington committee (see Appendix A). All of the plan was not accepted; for example, they felt it was not the proper time to attempt to assess attitudes in the manner prescribed in the design. The other phases of the plan were accepted with some modifications. With the exception of the communication phase, the modified plans were carried out. Evaluation data collection was administered by the Project Director and the results were analyzed by the Office of Research in Medical Education.

DESCRIPTION AND RESULTS:

Summary of the First Visitation

Extreme care must be taken in interpreting the evaluation data from this project. The maximum return of evaluation forms was about 25 per cent of the group while, in most cases, it dropped to well below 20 per cent. There is every reason to suspect that people who did return their forms were atypical. It is, therefore, misleading to use such an inadequate sample to generalize about the attitude of the total group. In fact, due to the small sample, the correlational analysis is not included in this summary. The following comments, then, apply only to those people who returned the evaluation forms.

In general, the ratings indicated a good, positive reaction to the experience on the part of all participants. There were no negative ratings for any session. The material presented was highly relevant for the participating doctors, as indicated by the high relevance score (3.15 out of a maximum of 4.00) and the fact that all expected to see some patients related to the presentation, and most (80 per cent) expected to see at least six cases per year for which the material presented was relevant. The nurses' sessions, although not so highly rated, also seemed to fill a need. The average relevance rating for nurses was 2.8 and, while 22 per cent reported that they were unlikely to see patients related to the material, 57 per cent felt that they would see more than five patients per year for whom the material would be relevant.

The lowest ratings were assigned to the "suited to objective" item. Since no objectives were specified, this is not unexpected: when in doubt, people tend to use the center of a rating scale. However, the concomitantly lower ratings assigned to "interesting" and "innovative" may indicate that further attention to method of presentation and more stress on the purposes of a session would be worthwhile. Nevertheless, the total picture seems to indicate that participants were well satisfied--as indicated by the over-all mean of 2.5 assigned to "objectives fulfilled" by both doctors and nurses.

Recommendations:

1. Earlier involvement in planning the evaluation procedures is necessary; especially, where information (such as session objectives) is needed from the speakers.

2. The speakers should be involved in the evaluation plans in order to elicit their cooperation and assistance in both instruments' development and administrative procedures. It is imperative that they know and accept the purpose for the evaluation.

3. Plans for collecting data must be more carefully worked out. It is rather useless to analyze the results unless at least 80 per cent of the participants respond.

4. There is sufficient evidence to support the continued use of these evaluation instruments or modification of the same for gaining information of the type they purport to measure.

5. Consideration should be given to the following two additional ways of evaluating these activities:

   a. Use of personal interview.

   b. Use of a group (M.D.'s, nurses, educator) to evaluate the program.

Stroke Telecasts

KNOWLEDGE GAIN EVALUATION

A 25-item multiple-choice test was designed by Drs. Fryer and Titus covering the material presented in the three televised stroke presentations and pretested on a group of physicians in a community similar to that of Yakima and its surrounding area, based on location from major medical facilities and size of town. The test was then administered to 55 physicians in the Yakima area who had agreed to participate in this aspect of the study. Five weeks after the last presentation of the series, the physicians were again administered the same test. Unfortunately, only 27, or 50 per cent, of the physicians completed the post-test due to various reasons, which included not having attended one or more of the televised sessions. All of the tests were administered anonymously, using codes,and results have been made available, pre- and post-, to the participants strictly on an anonymous basis. Generally, interpretations made from the data on this project should be guarded. The 50 per cent who took the post-test may, in some manner, be atypical of the whole group. For instance, of the physicians returning the post-test, 85 per cent attended three or four of the sessions while those who did not take the post-test tended to attend two or less of the sessions. However, there was no mean score difference between those physicians who did complete the post-test and those who did not complete the post-test in terms of the pretest mean scores.

Results: The test retest correlation coefficient for the instrument was .81 for those physicians who completed both pre- and post-test. This is a pretty good indication that the instrument itself is a fairly consistent arranger of those people taking it. The pre-test score for those persons completing both pre- and post-test was 3.84 and the post-test score mean was 5.68, which represents a mean score difference which is significant at the .02 level (t=2.67).

Discussion: The question of practice effect is not of much concern in this case as the time interval between pre- and post-testing is rather extended over a three-month period. While it is presumed that the increase in knowledge is due to the participation in the televised stroke series course, in reality a study such as this does not prove this in a definitive way. There are certainly opportunities for other variables to have intervened and caused this increase. However, one might say that participation in the project is associated with an increase in knowledge that is significant.

Change in Practice Measure

In order to meet the objective of designing instruments to reveal practitioner's progress toward goals through the use of hospital records, a study has been outlined which would examine patients' records before the onset of the stroke program and after the completion of the stroke program with an eye toward measuring any differences in physician behavior in terms of diagnosing, test-ordering, history-gathering and examination procedure. It was decided that a method which would facilitate this type of investigation would be the preparation by Drs. Fryer and Titus of a sample "ideal" check list against which each case folder could be compared. With this in mind, a pilot study was conducted during the fall by a medical student who went to Yakima and collected this data from 15 cases (see Appendix B). His results, which are summarized in his letter, show that such data collection is feasible and the results are interpretable. Generally, the pilot study seems to indicate that on preprogram case reports roughly only one-third of the "ideal" information has been gathered. It is planned to progress with the study in full over the summer of 1969 and a further report will be made of the results of that investigation at a future date.

Viewer Response to the Bedside Diagnosis of Stroke Program

As part of the assessment of the Washington-Alaska Regional Medical Program telecast series, "The Bedside Diagnosis of Stroke," the Office of Research in Medical Education was asked to make a brief inquiry to assess the attendance and attitude factors of those persons who viewed or had the potential to view the three broadcasts dealing with stroke. A more intensive investigation into these two factors was not seen as feasible by the program planners and, consequently, a post card was constructed which was felt to adequately assess the type of information desired. The results of the data are summarized below.

The total number of post cards sent out was 144. Returns were divided into two groups: those persons having attended a final wrap-up session following the three telecasts and those persons not attending the final wrap-up session.

Table 1 shows that a very low percentage of those who did not attend the wrap-up session returned the post cards (25 per cent). Of those who attended the wrap-up session, 86 per cent returned post cards. It is impossible, presently, to say whether those who did not return the post card and who did not attend the wrap-up session viewed or did not view any of the three telecasts. On the other hand, those persons who did attend the wrap-up session and presumably viewed one or more of the telecasts seemed more motivated to answer the post card and, thus, most likely constitute a different sample than the non-attendees. Thus it is most appropriate to view the data and statements made about these data in this report as applying to the samples of attendees and non-attendees only and not to generalize to the larger population of doctors in this Central Washington area.

One interesting feature of the results is that those persons who did not attend the wrap-up session seemed to view the programs on the whole more at home than in the hospital (see Tables 1 and 2). Perhaps all this means is that those who are more involved with the hospitals or located closer to the hospitals are more likely to view telecasts such as these in the hospital. But it could also mean that those who were more motivated (i.e., attended the wrap-up session in addition to the three telecasts) were those types of persons who would tend to go to the hospital to view the telecast. Of a possible total viewing percentage, that is, the number of people responding for each sample times the number of programs (i.e., 70 persons X 3 programs= 210 possible total viewing), 174 total viewings were indicated, or a viewing ratio of 83 per cent. For those who attended the wrap-up session, the ratio was 91 per cent. Again, either those persons who seemed motivated to attend the wrap-up session tended to view more telecasts, or else viewing more telecasts may have created an interest in attending the wrap-up session; from the data available, one can only hypothesize.

Looking at the percentages in Table 2, there appears to be a slight trend on hospital viewing to decrease over the three programs while the home viewing percentages seem to remain rather stable. The former tendency would agree with other studies involving radio or television presentations to medical audiences, one in New York State and the other in Utah. The latter phenomenon would have to be compared with information gathered from subsequent telecast series for confirmation.

The respondents were asked to indicate whether or not the telecast had been a worthwhile experience for them (see Table 3). A much higher percentage (92 per cent) of those who had attended the wrap-up session felt that the telecast had been worthwhile. Table 4 shows that, again, a much higher percentage of those who attended the wrap-up session seemed to be more involved in this case using the stroke pamphlet which was mailed to all doctors in the Yakima and surrounding area.

Attached are the various comments made on the post cards with regard to the use of the stroke pamphlet and general comments about the telecasts. In general, the telecasts were viewed favorably and it was felt that they were both worthwhile and instructive. There seems to be some feeling that the programs should be shown more than once with better physical arrangements, and that the sessions could be more personalized; but, overwhelmingly, the responses were enthusiastic.

In summary, the programs were well-received, the stroke pamphlet was considered valuable, not only for the programs but in its own right, and those who were involved were very much involved.

MULTIMEDIA FOLLOW-UP

Due to a delay in getting Phase 2 of the Central Washington Project underway on time, the Regional Medical Program substituted five "fill-in" shows dealing with "Hand, Voice and Eye in the Diagnosis of Heart Disease"; "Multiple Trauma"; "Obstetrical Emergencies"; "Face Pain"; and "Placebos." These programs were aired at the same times and over the same channel as the stroke telecasts.

As these programs did not deal with the same subject matter, it was decided to compare viewer response so far as possible as a further indication of the reaction to both these television presentations as a CME medium and of the relative popularity of the stroke programs. In investigating this question, we are aware that no conclusions can be drawn from such comparison as to whether the one series was more popular than the second.

Approximately one month after completion of the five programs, double post cards were sent out to all physicians in the Yakima and surrounding areas requesting that they indicate whether they had watched any of the programs and, if so, how many; the extent to which they liked or disliked the series, using a Likert scale ranging from "not at all" to "very much"; whether they preferred a multitopic, unitopic or had no preference. They were also asked to make suggestions for future presentations.

Results: An average of three of the five multitopic shows were watched by 93 physicians. Physicians who gave reasons for being unable to watch were not included. Ninety-one physicians rated the over-all series on the like-dislike dimension. The average rating was 4.49 out of a possible 5. The preferences were indicated as follows: Multitopic, 27; Unitopic, 35; No Preference, 33.

Discussion: The results seem to indicate a very popular and quite favorable response for the multitopic presentation. It should be noted that nowhere near the amount of publicity that accompanied the stroke presentations occurred with the multitopic series. Each individual presentation was not rated because such information was not of interest at this time. The rating with regard to the series is obviously very positive. It would be desirable to see whether the preference for a multitopic or unitopic or no preference was significant. A chi-square test was utilized with the result that the chi-square was not significant at the .05 level.

While one can say that some people have no preference for either type of series and that some people do have preferences because of the actual indication (i.e., 27 people prefer multitopic, 35 people prefer unitopic), it is not possible to say that significantly more people prefer one or the other nor that significantly more people have no preference. Perhaps a study is necessary attempting to determine what factors influence the liking and disliking of either type of presentation. It may be that there are other factors that related to whether the topics were multitopic or unitopic which have influenced these results. Another observation is that whether the respondents preferred multitopic, unitopic or had no preference, their ratings for the series based on present data were very positive. Thus, it is not possible to say that preference goes along with like in this case.

Suggestions: Suggestions made by the physicians were not numerous and centered around more convenient scheduling--usually later in the day, surprisingly--and around specific areas such as diagnosis of fractures, differential diagnosis and dyslexia, dermatology, chronic respiratory disease, infectious disease, current status of antibiotic therapy, and use and abuse of laboratory tests. But also, there were suggestions for wrap-up sessions at the end of each series and re-runs of the series so that those who missed parts of them could view them.

Summary: There are, of course, innumerable untold variables operating so that a study such as this cannot be conclusive in terms of cause-and-effect relationships or even that the relationships that exist are not due to some unknown factor. For instance, it is not known why the multitopic programs were liked so well; only that they were liked. For that matter, the stroke programs were also liked although not as well, apparently, as the multitopic; yet, there is no preference for multitopic over unitopic, such as the stroke series, indicating a need for a further study into the causative factors for likes and dislikes and preferences. For whatever reason, the multitopic programs were very well-liked, as well as well-watched. Generally, suggestions for future presentations were individual, indicating that, as far as this measure is concerned, at this time there is no consensus as to what subject matter should be emphasized in the future.

Discussion: While the full impact of this program cannot be assessed without the completion of the change in practice measure that will take place later in the year 1969, information gathered to date suggests that the programs, as a whole, were successful in that a majority of the viewers rated them positively. The number of viewers increased from the first presentation of the stroke series through the multimedia presentations. Whether this was due to the content of the following programs or whether it was due to an increasing interest in the televised CME broadcasts is, of course, not discernible. But, it is possible to argue that CME televised instruction such as that presented in the Central Washington Project is in part justified on the basis of the interest shown by the physicians in that area over a wide variety of subject matter areas. Furthermore, comments from the physicians themselves indicate that, not only did they increasingly enjoy the presentations, but wanted more. There were many suggestions for future broadcasts, not necessarily centering around the central RMP goals of heart, cancer and stroke. One thing that is also perhaps apparent is that it is probably not feasible to visualize any given physician viewing an entire series of a program operated in a voluntary manner. The results of the study indicate that this was a rare occurrence and probably due to irregular and heavy schedules that doctors in practice are subject to.

As expressed, it was demonstrated that knowledge gain of a content type did take place over the stroke series. Whether the method utilized, namely televised instruction, was more efficient than live lecture method was not investigated; other studies in this area (research on teaching the visual arts, Jerome Hausman, Ohio State University in Handbook of Research on Teaching, N. L. Gage (ed.), American Educational Research Association, Rand-McNally & Company, Chicago, 1967) have shown that there is little apparent differences in terms of measures such as knowledge gained when comparisons are made between televised instruction and traditional lecture methods.

As the ultimate goal of the Central Washington Project was to effect a change in practice measure, the record study will be of crucial importance. It is an attempt to quantitatively assess behavioral changes at a behavioral level. Knowledge gain, enthusiasm of participants, and other non-behavioral changes are of little value unless used by the physician in the diagnosis and treatment of his patients.

TABLE 1

LOCATION AND VIEWING SUMMARY FOR STROKE TELECASTS

Program	Viewing Location	Attended Wrap-up	Did Not Attend Wrap-up	Totals
#1	Home	8	9	17
	Hospital	35	11	46
	Viewers	43	20	63
#2	Home	12	4	16
	Hospital	30	9	39
	Viewers	42	13	55
#3	Home	14	6	20
	Hospital	30	6	36
	Viewers	44	12	56
Viewing Totals (all programs)	Home	34	19	53
	Hospital	95	26	121
		129	45	174
Total Returns		47	23	70

TABLE 2

LOCATION AND VIEWING SUMMARY OF STROKE TELECASTS

Program	Viewing Location	Attended Wrap-up	Did Not Attend
#1	Home Hospital	19% 81%	45% 55%
#2	Home Hospital	29% 71%	31% 69%
#3	Home Hospital	32% 68%	50% 50%
Viewing Totals	Home Hospital	26% 74%	42% 58%
Returns		86%	25%

TABLE 3

"Have these telecasts been a worthwhile experience for you?"

	Yes	No	Undecided
Attended wrap-up	92%	4%	4%
Did not attend	62%	24%	14%

TABLE 4

"Did you use the stroke pamphlet?"

	Yes	No
Attended wrap-up	96%	4%
Did not attend	57%	43%

COMMENTS OF PARTICIPANTS ATTENDING THE WRAP-UP SESSION
FOR
YAKIMA STROKE PROGRAMS

(N = 47)

ITEM 2:

Excellent, good, well-done, etc. (12)*
To be seen at least twice.
I learned.
Regardless of interest area, they are opening local academic channels.
Strongly advise they be continued in same fashion as now.
Out of my specialty, but interesting.
Not in my field. (3)*
Long time since last comprehensive review.
Difficult to view entire program. Suggest one, half-hour showing.
Lacks involvement of the audience--too general a topic.

ITEM 3:

Good, excellent, etc. (12)*
Will keep for review. (2)*
Nice medical didactics.
This will become a part of my files with comments added.
Program would be lost without it.
Appreciate its brevity and conciseness.
Well-done, but too brief.
Not so helpful as "2".
More detail on drawings.
Lacks many details I would like to review and don't remember from T.V.
Could have more systematic arrangement.
I am a pediatrician--did not get a pamphlet.

ITEM 4:

Excellent, well-done, informative, etc. (31)*
Necessary for completion of project.
Personalized the sessions.
Summary of emergency care good.
Excellent; night would be better.
I had to leave after 10 minutes.
Good, not enough time.
Not enough time, poor organization.
Very good. Hard to hear loud speaker. Poor reproduction.
Need better physical arrangements.
So-so--not too much help.
We need more help with treatment.
Not dynamic enough.
???
T.V. repetitive, personal comments (Q & A's) by doctors excellent.

COMMENTS OF PARTICIPANTS NOT ATTENDING THE WRAP-UP SESSIONS
FOR
YAKIMA STROKE PROGRAMS

(N = 23)

ITEM 2:

Well-organized and informative.
Worthwhile in regard to this particular subject.
Outlined quickly importance of several quick, easy steps in diagrams.
Would think a brief review in one to two months would reinforce retention of material.
Would like continuous program on one subject until complete.
Well-done, though not very useful to me as a pediatrician. I found them interesting. (3)*
Fair review. Not worth time and money spent by production.
By a good stroke of fortune, I didn't see them.
Forgot to watch two programs.
Television reception was poor.

ITEM 3:

Well-done, worth having for reference. (2)*
Adequate for material covered.
Help fix salient points.
No time.

ITEM 4:

Good; let's have more, etc. (3)*
Desire more practical information; e.g., therapy relative to specific problems.
Usefulness of cancer and heart programs would be debatable as regards my specialty--ophthalmology.
Telecast #2 did not begin until 7:50 a.m.
Local problems with reception.
Continuing education program would benefit from long-term series.

RECORD STUDY

I. Purpose

In the final stage of the assessment of the Washington/Alaska Regional Medical Program telecast series, "Bedside Diagnosis of Stroke," the Office of Research in Medical Education was concerned with measuring the effect that the Regional Medical Program stroke series had upon the care of stroke patients in Yakima by evaluating the hospital records both before and after the series.

As a preliminary step a feasibility study was conducted, August, 1968. At that time Mr. Haigh Fox, a fourth-year medical student, investigated a sample of fifteen records from St. Elizabeth Hospital using a check list devised by Dr. David Fryer, neurologist and co-author of the video series. A complete summary is available in the Appendix. Essentially the pilot study resulted in minor suggestions for revisions of the check list and in confirming the feasibility of conducting a complete evaluation.

II. Design and Method

A pre-series, post-series matched group design was employed. All CVA coded files available at St. Elizabeth and Yakima Valley Memorial Hospitals for a period of six months prior to the series presentation, October, 1968, and six months post were used. The files were analyzed and the number and kinds of information found were recorded on a "stroke series check list" (see Appendix) by Mr. Darrell Hull of the Office of Research in Medical Education.

The combined number of files was 180 with approximately equal numbers in the before- and after- series divisions. Inspection showed that 38 physicians authored these files but, when a given physician's patients were matched to him and divided into pre- and post-series groups, some had handled only a single CVA patient, either pre- or post-, and so were deleted. The resultant sample was 22 physicians matched with their patients, each with one or more patients in his pre- and post- group.

The stroke evaluation check list was the sole instrument for the medical file evaluation. The five major categories: diagnosis, present illness, examination, order sheets, and laboratory tests had a potential of a "noted generally" rating, indicating that only general information was recorded with respect to that category. The 48 more specific subcategories could be rated "yes," (there was positive or negative information recorded regarding following), or "no," (there was not information recorded), or "unobtainable," (for whatever reason).

There was also a blocked area for additional clarifying notes. "Noted generally" and "yes" received a numerical value of one point while "no" and "unobtainable" received zero points. The two sets of scores, pre- and post-group scores, for the 22 physicians were obtained by summing and averaging the points from the check list.

Delimitations: Several limitations of this instrument should be noted here. Perhaps the major problem was in "quantifying" physician recordings such as, "The patient's head and neck are within normal limits." Does this mean that there is no skull tenderness bruits or neck rigidity? We decided to require an exact reference to a specific scale (subcategory) before crediting a point; this issue still required some judgment on the part of the investigator. Secondly, there were a number of scales which were not applicable on a given case, e.g., "uses oral contraception" for males, or given "writing" and "reading" tests for a comatose patient. The former proved to be no problem because contraceptive use was not referred to in any of the files and the latter again required a judgmental decision from the investigator.

III. Statistical Operation and Results

The pre-series scores were divided by hospital to see if check lists from one hospital yielded higher scores. A t-test was done between the means of the two hospitals and the 1.934 value proved to be not significant.

The physicians' files from both hospitals were combined and a correlation was run between the total scores, the sum scores for both major and subcategories, of the 22 pre- and post-sets. There was no consistent relationship between these pairs of scores, evidenced by the near zero correlation, Pearson r = .00389. The means for the two groups were essentially identical and a t-measure of difference was .047.

Pursuing the notion that the number of television programs watched might be related to the scores obtained, correlations were made, between the number of programs viewed and pre- and post-scores. No significant relationship was found for the pre-scores (r = .28) but a negative correlation, significant at the .05 level, was found between the number of programs watched and post-series scores (r = -.49)!

Finally, the "noted generally" scales for the five major categories were examined. Means were derived for this scale only and the pre- and post-series evaluated for statistical difference. Again the means had to be assumed to be essentially the same with a t-value of 1.415. A correlation was next run between the number of programs watched by the physicians and their "noted generally" post-score mean. The coefficient was not significant (r = .10).

IV. Conclusions

It can be concluded that the data does not support the hypothesis that the "Bedside Diagnosis of Stroke" series facilitated better care of patients if chart recording behavior is our criterion for measuring increase in quality of care. Naturally this criterion is itself questionable. Perhaps a significant improvement in patient care, diagnosis, examination procedure, etc. did occur. All we can say is that it did not appear upon evaluation of the medical records. It should be recalled, however, that preciseness and completeness of file recording was not one of the stated objectives in the stroke series program. To expect a significant change in recording behavior may be, then, a little unrealistic.

Generally, the statistical procedures showed that the extent of relationship between such variables as number of programs watched or pre-scores and post-scores was negligible. The exception was the relationship wherein the higher post-scores tended to go with fewer viewings of the stroke series programs. While several interesting hypotheses for this relationship might be generated, the most reasonable is that there were simply chance-factors causing this statistical significance.

The scales were not of concern individually, for the most part, but a few warrant comment. The final scale dealing with a judgment as to the physician's apparent grasp of the patient's problem proved to be too nebulous or elusive for the researcher to adequately rate. The unobtainable rating column proved to be another problem area, which did not lend itself to reasonable assessment and proved to be of little value to the study.

STROKE EVALUATION CHECK LIST

Hosp.#______________________ Age___ M or F: PRE or POST; Physician______________

ed ally	Yes	No	Unob-tainable	
				DIAGNOSIS
				type of lesion
				site of lesion
				degree of severity
				PRESENT ILLNESS
				at rest or activity } Type of Onset
				sudden or progressive } Type of Onset
				presence of headache } Type of Onset
				severity of headache (if present)
				site of headache (if present)
				use of oral contraceptives (female)
				PAST HISTORY
				strokes
				syncope
				transient ischemic episodes
				hypertension
				migraine
				seizures
				family occurrences
				EXAMINATION
				blood pressure both arms
				skull tenderness
				bruits in the neck
				retinal artery pressure measure
				neck rigidity
				presence of hemiparesis
				degree of hemiparesis (if present)
				pronations sign or leg drift sign (if hemi present)
				presence of sensory disturbance
				presence of extinction
				loss of optokinetic nystagmus
				visual field defects
				grasp reflex
				aphasia } as applicable
				speech } as applicable
				writing } as applicable
				reading } as applicable
				understanding the spokane word } as applicable
				ORDER SHEETS & LAB TESTS
				sedative prescribed
				blood sugar
				area nitrogen
				skull X-rays
				arteriogram
				EEG
				brain scan

			salt
			H_2O
			calories
			PT (if indicated)
			lumbar punctures
			anti-coagulation
			apparent synthesis of patient's problem

APPENDIX

PROPOSED EVALUATION MEASURES FOR YAKIMA PROJECT

I. ATTITUDE CHANGE MEASURE

Considerations:

The Semantic Differential is a device for measuring attitudes toward a construct and also the relationships of the construct concepts to each other. The most commonly used scales define the construct selected on the dimensions: evaluative (good-bad), potency (weak-strong), and activity (active-passive).

Thus a concept such as "television" could be seen as strong, active, and potent or as various degrees of these factors. It could also be seen in relationship (i.e., where it stands with all other concepts being measured). The overall evaluation of the concepts defines an attitude toward the construct (here, the Yakima Project).

The purpose of the Differential is for attitude measurement and it may be used to test attitude hypotheses. It is suggested that one way of measuring the effectiveness of a continuing medical education program would be to measure attitudes toward relevant concepts of that program before and after the program.

The following are examples of what are felt to be some relevant concepts to continuing medical education attitude, specifically for the Yakima Project: televised learning, television, lecture, televised lecture, review material, research material, continuing medical education, practical material.

The research hypothesis is that there will be a significant change of physician attitude during the course of study: specifically, that "televised lecture," "televised learning," and "continuing medical education" will come to be seen as more active, stronger, and better.

We feel that it is also important to see whether participants' attitudes toward: "television," "lecture," "review material," "research material," and "practical material" change as a result of these programs. Other studies, such as "Urology for Non-Urologists," have shown disagreement about these concepts and continuing medical education. The data would provide guidelines for the planning of future programs by serving to 1) identify the desires of the audience, 2) specify the composition of the audience with regard to their attitude toward the purposes and the presentation of the program.

The Semantic Differential is thus a flexible and demonstrably reliable device for measuring attitudes. It is felt that attitudes are one indication of the effectiveness of a program such as the Yakima Project. The scale is completed rapidly (approximately 15 minutes) and the data can be dealt with anonymously.

DIRECTIONS

Below is a term which can be rated by placing an X in the space which best represents your feeling about that term for various pairs of words.

House

very   very

good ______:______:______:______:______:______:______ bad

active ______:______:______:______:______:______:______ passive

weak ______:______:______:______:______:______:______ strong

First, you would decide whether you feel HOUSE seems "good" or "bad." If you feel HOUSE was very "bad," you would place an X in that space. You may place an X wherever you feel it should be to represent your feelings about the term HOUSE.

While this may seem difficult, it has been shown that such ratings of terms are possible and reliable if done rapidly, without dwelling on each scale. It is then possible to get a picture of how each term is seen with regard to the various pairs of words.

On the following pages are several terms. Please work rapidly and mark each term on every scale. Do not omit any terms or ratings.

Television is:

very   very

light ____ : ____ : ____ : ____ : ____ : ____ : ____ heavy

bad ____ : ____ : ____ : ____ : ____ : ____ : ____ good

large ____ : ____ : ____ : ____ : ____ : ____ : ____ small

clean ____ : ____ : ____ : ____ : ____ : ____ : ____ dirty

fast ____ : ____ : ____ : ____ : ____ : ____ : ____ slow

weak ____ : ____ : ____ : ____ : ____ : ____ : ____ strong

ugly ____ : ____ : ____ : ____ : ____ : ____ : ____ beautiful

passive ____ : ____ : ____ : ____ : ____ : ____ : ____ active

sharp ____ : ____ : ____ : ____ : ____ : ____ : ____ dull

Televised learning is:

very   very

large ____:____:____:____:____:____:____ small

slow ____:____:____:____:____:____:____ fast

weak ____:____:____:____:____:____:____ strong

beautiful ____:____:____:____:____:____:____ ugly

active ____:____:____:____:____:____:____ passive

light ____:____:____:____:____:____:____ heavy

clean ____:____:____:____:____:____:____ dirty

good ____:____:____:____:____:____:____ bad

sharp ____:____:____:____:____:____:____ dull

Lectures are:

very very

fast ______ : ______ : ______ : ______ : ______ : ______ : ______ slow

ugly ______ : ______ : ______ : ______ : ______ : ______ : ______ beautiful

large ______ : ______ : ______ : ______ : ______ : ______ : ______ small

active ______ : ______ : ______ : ______ : ______ : ______ : ______ passive

strong ______ : ______ : ______ : ______ : ______ : ______ : ______ weak

dull ______ : ______ : ______ : ______ : ______ : ______ : ______ sharp

dirty ______ : ______ : ______ : ______ : ______ : ______ : ______ clean

heavy ______ : ______ : ______ : ______ : ______ : ______ : ______ light

good ______ : ______ : ______ : ______ : ______ : ______ : ______ bad

Televised lectures are:

very   very

fast ______:______:______:______:______:______:______ slow

passive ______:______:______:______:______:______:______ active

heavy ______:______:______:______:______:______:______ light

small ______:______:______:______:______:______:______ large

dull ______:______:______:______:______:______:______ sharp

good ______:______:______:______:______:______:______ bad

ugly ______:______:______:______:______:______:______ Beautiful

strong ______:______:______:______:______:______:______ weak

clean ______:______:______:______:______:______:______ dirty

Review material is:

very very

ugly ____:____:____:____:____:____:____ beautiful

good ____:____:____:____:____:____:____ bad

large ____:____:____:____:____:____:____ small

sharp ____:____:____:____:____:____:____ dull

clean ____:____:____:____:____:____:____ dirty

light ____:____:____:____:____:____:____ heavy

weak ____:____:____:____:____:____:____ strong

slow ____:____:____:____:____:____:____ fast

passive ____:____:____:____:____:____:____ active

Research material is:

very   very

active ____ : ____ : ____ : ____ : ____ : ____ : ____ passive

small ____ : ____ : ____ : ____ : ____ : ____ : ____ large

fast ____ : ____ : ____ : ____ : ____ : ____ : ____ slow

dull ____ : ____ : ____ : ____ : ____ : ____ : ____ sharp

clean ____ : ____ : ____ : ____ : ____ : ____ : ____ dirty

bad ____ : ____ : ____ : ____ : ____ : ____ : ____ good

light ____ : ____ : ____ : ____ : ____ : ____ : ____ heavy

weak ____ : ____ : ____ : ____ : ____ : ____ : ____ strong

ugly ____ : ____ : ____ : ____ : ____ : ____ : ____ beautiful

Continuing Medical Education is:

very very

small ____:____:____:____:____:____:____ large

beautiful ____:____:____:____:____:____:____ ugly

heavy ____:____:____:____:____:____:____ light

sharp ____:____:____:____:____:____:____ dull

strong ____:____:____:____:____:____:____ weak

fast ____:____:____:____:____:____:____ slow

good ____:____:____:____:____:____:____ bad

active ____:____:____:____:____:____:____ passive

Practical material is:

very   very

bad ______:______:______:______:______:______:______ good

ugly ______:______:______:______:______:______:______ beautiful

active ______:______:______:______:______:______:______ passive

heavy ______:______:______:______:______:______:______ light

weak ______:______:______:______:______:______:______ strong

dirty ______:______:______:______:______:______:______ clean

fast ______:______:______:______:______:______:______ slow

dull ______:______:______:______:______:______:______ sharp

large ______:______:______:______:______:______:______ small

II. KNOWLEDGE GAIN MEASURE

Considerations:

1. There must be a base rate group which does not attend which is tested before and after the sessions. If necessary, the comparison could be made on two random groups from the population of non-participating physicians.

2. There must be a pre- and a post-test demonstrably equivalent; or the same test may be used if test-retest reliability is shown to be high.

3. If the same group can be tested before and after a particular session, or series if possible, then the data can be evaluated in terms of net gain.

4. Ideally, the groups would be stratified samples; however, this seems to present too many problems of data gathering.

5. All designs are for one session or one series; they would have to be repeated for each area, e.g., cancer, stroke, heart, if information is desired for each.

6. Preliminary test construction should be done on two groups separate from those who attend and those who do not attend samples.

7. Whether the physician watched at home or at a hospital, what type of practice he engages in, age, date of graduation, and postgraduate study should be considered in evaluation. Thus, a third design would be analysis of covariance or randomized blocks.

8. The period after the sessions before post-testing determines whether we are measuring immediate recall or permanent knowledge gain. Thus, a decision must be made for when post-testing will take place.

DESIGN 1:

A random sample of the non-participating physicians for any given session, or series if possible, is to be administered test a. A random sample of the participating physicians for the same session or topic will also receive test a prior to the session. After each session, a random sample of participating physicians, as well as a random sample of non-participating physicians, will take test b. (Note: The same design would apply for a test retest using the same instrument.)

DESIGN 2:

A random sample of non-participating physicians for a given session (or series) will receive test a. A random sample of participating physicians would also receive test a. Both groups would be tested at the end of the session or topic.

DESIGN 3:

Data on age, postgraduate work, viewing conditions, practice, and date of graduation would be gathered for all physicians participating in the study. Pre- and post-tests would be administered to those physicians attending a given session (or series). Also, a control group would be measured and demographic data gathered. A randomized block design would be used to evaluate the results.

Design 3 is the most preferable, design 2 is next preferred, and design 1 is least preferred from a statistically defensible viewpoint.

III. CHANGE IN PRACTICE MEASURE

Considerations:

1. Cooperation for access to records would be necessary from the hospitals serving the central area.
2. Criteria for desired diagnostic tests and treatments would have to be established.
3. It would be necessary to know which doctors attended each lecture.
4. A staff would be necessary to search the records.
5. No knowledge testing would be necessary to evaluate the effectiveness of the project.

DESIGN:

Hospital records would be examined for a period prior to the series for patients whose final diagnosis for the admitting symptoms is known. Histories, tests, and treatments ordered would be recorded. The results could be assigned scores based on criteria established by the lecturers.

In order to derive criteria for assigning scores, it would be necessary to meet with the lecturer(s) for each program. Minimally acceptable practice and desired practice levels as well as the relative importance (weights) of the various parts (i.e., history, treatment, and tests, etc.) would have to be ascertained.

The first examination of the hospital records could begin as soon as the final program had been written and the criteria established.

At a determined period after the series, the records would again be examined using the same criteria. The scores before the series and after the series would then be compared. Higher scores following the series would indicate practice changes.

The relationship between number of lectures attended and practice change could be examined as well as other relationships determined in advance provided the data are accessible.

IV. COMMUNICATION EVALUATION

Objectives 2 and 3 for the Yakima Project are to improve communication between Seattle and Yakima and Yakima and its surrounding communities.

We feel that four types of measurable communication are:

1. telephone.
2. letters.
3. personal visits.
4. referral letters.

Increases in frequency of these communication channels could be interpreted as being related to the Yakima Project if a base rate count were established before the series for comparative purposes.

Method:

1. Select a sample of physicians in the Seattle and Yakima areas who are referral targets. A sample would be selected for each series and would include the series lecturer(s).

2. If cooperation can be obtained, the secretaries would record (count) the number of contacts for each of the four above methods of communication. This count would start immediately and continue for three months following the particular series.

3. Recording forms and instructions will be supplied to the secretaries by the Office of Research in Medical Education.

EVALUATION OF VIDEOTAPE PROGRAM FOR BEDSIDE DIAGNOSIS OF STROKE

Directions: Each incomplete statement below is followed by four suggested completions that make the statement either true or false. Circle either "T" for true or "F" for false for each of the four parts. It is necessary that you answer each part of the question, otherwise these data will be unusable.

1. A completed stroke is

C1-18 (a) characteristically caused by cerebral thrombosis. T F

(b) a stroke more than four weeks old. T F

(c) a stroke which is not progressing in severity. T F

(d) a stroke which is as severe as possible. T F

2. Optokinetic nystagmus is

(a) loss associated with lesions in the occipital lobe. T F

(b) not impaired when the visual fields are normal. T F

(c) elicited with a fast revolving striped drum. T F

(d) lost to the right in a right hemisphere lesion. T F

3. In hemiparesis

(a) flexion tone is characteristically increased in the arm and the leg. T F

(b) Babinski sign is always present in the affected side. T F

(c) pronation tone is characteristically increased in the forearm. T F

(d) weakness is usually demonstrated more easily in the arm than the leg. T F

29

30

4. In hemiparesis the sternocleidomastoid muscle

- (a) is paralyzed on the opposite side. T F
- (b) is paralyzed only when the trapezius muscle is involved. T F
- (c) may be paralyzed without involvement of the trapezius. T F
- (d) is never paralyzed. T F

5. Transient ischemic attacks

- (a) are nearly always followed by a completed stroke. T F.
- (b) are associated with arterial stenosis. T F
- (c) usually get progressively more severe. T F
- (d) are caused either by spasm or small emboli. T F

6. A pure motor stroke is characteristically

- (a) caused by occlusion of a small penetrating artery. T F
- (b) caused by a lesion in the motor cortical area. T F
- (c) associated with carotid artery disease and low blood pressure. T F
- (d) caused by a lesion in the basal ganglia. T F

7. Apraxia

- (a) is of no localizing value. T F
- (b) may involve only the left hand. T F
- (c) is caused by cerebellar disease. T F
- (d) is caused by a combined loss of sensation, strength, and coordination. T F

46

47

8. A grasp reflex is

   (a) a sign of a lesion in the frontal lobe on the opposite side. T F

   (b) elicited by firm pressure on the back of the hand. T F

   (c) an early sign of temporal lobe herniation. T F

   (d) most commonly seen in subarachnoid hemorrhage. T F

9. Spasm of cerebral arteries

   (a) gives rise to transient ischemic attacks. T F

   (b) may occur in migraine attacks. T F

   (c) commonly causes completed strokes. T F

   (d) occurs with subarachnoid hemorrhage. T F

10. Occlusion along the course of the Posterior Cerebral Artery characteristically

   (a) produces homonymous hemianopia. T F

   (b) is associated with abnormalities of optokinetic nystagmus. T F

   (c) produces an infarct in the medial occipital lobe. T F

   (d) is commonly not associated with symptoms other than homonymous hemianopia. T F

11. Paralysis of the third cranial nerve produces

   (a) severe ptosis. T F

   (b) a large pupil T F

   (c) paralysis of upward and inward gaze. T F

   (d) deviation of the eye outward. T F

62

63

12. In hemiparesis, the muscles of the forehead are not usually involved because

- (a) they are supplied by both facial nerves. T F
- (b) they are involuntary muscles. T F
- (c) they are supplied by both the 5th and the 7th nerves. T F
- (d) they are innervated by both sides of the cerebral cortex. T F

13. Blood in the spinal fluid is

- (a) not caused by a traumatic tap if the centrifuged fluid is xanthochromic. T F
- (b) always present in intracerebral hemorrhage. T F
- (c) always present in subarachnoid hemorrhage. T F
- (d) usually absent in cases where the spinal fluid pressure is elevated. T F

14. Neck rigidity is an important sign of

- (a) subdural hematoma. T F
- (b) subarachnoid hemorrhage. T F
- (c) migraine. T F
- (d) basilar artery thrombosis. T F

15. Headache is

- (a) characteristically present in cerebral embolus on the side where the embolus is lodged. T F
- (b) characteristically severe in subdural hematoma. T F
- (c) often absent in subarachnoid hemorrhage. T F
- (d) often absent in intracerebral hemorrhage. T F

74

75

16. Extinction of sensation is a sign

(a) of a lesion in the thalamus. T F

(b) of prognostic importance. T F

(c) of disease in the parietal lobe. T F

(d) characteristically associated with a grasp reflex. T F

17. The corpus callosum is

C2-7

(a) a large structure connecting the cerebral hemispheres. T F

(b) supplied partly by the middle cerebral artery. T F

(c) supplied chiefly by the anterior cerebral artery. T F

(d) supplied partly by small penetrating arteries from the circle of Willis. T F

18. A lesion in the temporal lobe characteristically

(a) produces abnormalities of optokinetic nystagmus. T F

(b) produces superior homonymous quadrantinopia. T F

(c) is caused by occlusion of the anterior cerebral artery. T F

(d) may damage the lower part of the optic radiation. T F

19. Paralysis of the 3rd cranial nerve caused by diabetes is usually characterized by

(a) absence of ptosis. T F

(b) the pupil being smaller than on the normal side. T F

(c) absence of pupillary involvement. T F

(d) bilaterality. T F

18

19
20. Internuclear ophthalmoplegia is

(a) characteristically associated with ptosis. T F

(b) always caused by damage to the medial longitudinal fasciculus. T F

(c) often bilateral. T F

(d) associated with nystagmus in one eye. T F

21. In measurement of retinal artery pressure

(a) the examiner observes the arteries only in the optic discs. T F

(b) the onset of arterial pulsation as the pressure is increased indicates systolic pressure. T F

(c) pressure is applied over the anesthetized cornea. T F

(d) measurement must be made on both sides. T F

22. Stroke-in-evolution

(a) is associated with migraine. T F

(b) is characteristically associated with hypertension. T F

(c) is characteristically followed by good recovery. T F

(d) may be caused by a cerebral hemorrhage. T F

23. Internal carotid artery stenosis may be indicated by

(a) reduced retinal artery pressure on the affected side. T F

(b) lowered blood pressure in the arm on the affected side. T F

(c) neck bruit. T F

(d) Amaurosis Fugax. T F

34

35

24. Subdural hematoma

(a) may be associated with seizures. T F

(b) is nearly always associated with a history of trauma. T F

(c) may be associated with oral contraceptives. T F

(d) is characteristically associated with severe hemiparesis. T F

25. Aphasia

(a) is usually caused by a lesion in Broca's area. T F

(b) is usually caused by disease in the right hemisphere. T F

(c) may involve reading and writing. T F

(d) is characteristically associated with dementia. T F

42

7 This test is anonymous. However, in order to evaluate this program, it is necessary to have some means of keeping the results separate. For this reason, please write the month and day of your birth and your middle initial on the lines below:

Month ______________________
Day ______________________
Initial ______________________

PLEASE check to make sure that you have answered each part of each question and have filled in the personal information requested above.

Charles Dohner, Ph.D.
Office of Research and
Medical Education

APPENDIX D

A SURVEY
of
CONTINUING MEDICAL EDUCATION
FOR PHYSICIANS
in the
STATE OF WASHINGTON

PHASE I

A joint effort of the

Washington State Medical Education and Research Foundation

and the

Washington-Alaska Regional Medical Program

September 1968

This survey and this report were made possible by support of the Washington-Alaska Regional Medical Program, Division of Regional Medical Programs, National Institute of Health, U. S. Department of Health, Education, and Welfare.

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Roland D. Pinkham, M.D., President of the Foundation
Lucius D. Hill, M.D., President of the Washington State Medical Association, 1966-67
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Thanks also is given to those eleven physicians noted below who were asked to pre-test the questionnaire by completing it and commenting on their reactions when they first glanced through it and as they answered the questions:

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Much of the success of the study is due to the part the above individuals played in its development.

And finally, thanks is extended to all those 3,604 physicians who returned the questionnaire.

Roth J. Kinney and Jack P. Kornfeld

INTRODUCTION

Recently the President of the Washington State Medical Association, Charles D. Muller, M.D., wrote in part:

> "Adequate health care of the highest quality for all Americans has been moved from the realm of debatable social issue to a position of public policy. . . ." [1]

The medical profession has promoted this quality by several means. One is by providing opportunities for continuing education for its members.

Licensure laws were enacted before the technological explosion which began in the late 1930's. As a result, these laws did not recognize that new information and innovation would render a licensee's original qualifications obsolete unless periodically upgraded. Few state laws regulating medicine require the prevention of professional obsolescence. But the physician knows that he must keep up because, as Dr. Muller points out, "The medicine of today and tomorrow is different from any ever practiced before. It can do enormous good, but is also dangerous and can harm. At one extreme, contemporary medicine is so complex that a single physician cannot provide it with safety and efficiency. At the other extreme, it is so simple that a remedy can be applied by anyone of average ability." [2]

The needs and the demands of the physicians for continuing medical education in recent years have been provided in part by the University of Washington, the county medical societies, hospitals, the Cancer Society, the Heart Association,

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1. Muller, Charles D., M.D., President's Page, "Quality of Health Care and Licensure", Northwest Medicine, August 1968, p. 769.
2. Ibid.

specialty societies, the Regional Medical Program, and the physicians' own State Association.

Seminars, symposia, circuit courses, grand rounds, consultations, and extensive postgraduate courses are all used as means of transmitting this medical knowledge. And in the interim, the physicians read journals, newspapers, books, and listen to the radio and recorded tapes, and watch medical television in an attempt to "keep up".

How well are the continuing medical education needs of the physician being met? Are the physicians satisfied? Can they find worthwhile courses in the state or do they have to go elsewhere? What about costs and time and convenience of location? Is one type of program, one sponsor, one media better or worse than others? On what subjects would the physicians like to have more emphasis placed? These are pertinent questions to those who purport to serve the physician. Physicians, as a group, are very astute, wonderfully dedicated and motivated, and busy servants of mankind. The physician needs help, the right kind of help, and he is the one to ask how well we are doing by him.

Thus the Regional Medical Program and the Washington State Medical Association, through its research arm, the Washington State Medical Education and Research Foundation, decided to pose these questions to the physician population of the State of Washington.

From November of 1966 to January of 1968, Mr. Richard F. Gorman, Drs. Lucius D. Hill, Donal R. Sparkman, John R. Hogness and others wrestled with the problem of how to conduct the survey and how to finance it. Their original plans were rather ambitious -- very complete and well considered -- but financing became too much a problem so the plans were modified and cut down so that the Regional Medical Program could underwrite much of the cost.

By January of 1968 the plans were complete, the financing was allocated, the survey was pre-tested, all the ground work was finished, so the questionnaire with which to gather the necessary information was turned over to the survey staff.

Seventy-five percent of the questionnaires mailed were returned and it was thought to be quite good under the circumstances. The 4,778 in the survey included all physicians with Washington State addresses registered with the American Medical Association. This included Washington State Medical Association members and non-members, interns, those in residency, teachers, administrators, those in the military, other government service, retired, private practice, some were ill and some had died.

This study is based on the findings from 3,364 questionnaires which were filled in (not necessarily in their entirety) and returned prior to the cut-off date of July 18.

In summary, here is the breakdown of the questionnaires:

QUESTIONNAIRES MAILED, RETURNED, AND USED

Total Mailed		4,778
Total Returned		3,604
Percent Returned		75.34
Total Returned		3,604
Not Used in Survey		
Returned too late	37	
Returned without name	3	
Returned but not used for other reasons *	200	240
Total Used in Survey		3,364

*Physician wrote that he did not feel qualified because he was retired, not in private practice (teaching, in armed services, intern, in residency), or in the case of six physicians, their wives wrote that the physicians were deceased.

CONCLUSION

The completion of this survey on the needs of the physician for continuing medical education leaves the project directors with these conclusions:

1. Those responsible for providing continuing medical education for the physicians in the State of Washington are performing their task well. The quality of courses and formal programs, however, is rated much higher by the physician population than is the quantity. More needs to be done.

2. Specialty societies are doing much better with their programs and journals than any other group. This suggests that the other groups may well examine what the specialty groups are doing so well to please the physician. Perhaps this examination will show only that comparisons should not be made, for the audience and the purposes are not the same. Broad in one case and specialized in the other, perhaps the meetings rating the lowest are still proving their worth and cannot be expected to be more effective in the area of continuing medical education. Likewise, media such as Tel-E-Med, educational television and motion pictures, which were rated so poorly by the physicians, may be doing all that reasonably can be expected of them. It is entirely possible, however, that a more imaginative director may produce television and motion pictures which the physicians may rate much differently.

3. Greater attention needs be paid to the continuing medical education of the rural general practitioner.

4. Concerning the questionnaire itself, this conclusion was reached:

The questionnaire was a good one and provided much interesting and informative data. As with most things, though, flaws did show up. Some of the answers were difficult to evaluate and others raised further questions. Some of the information gained needs to be clarified and expanded upon or related to other pertinent information. The last can be done by matching the questionnaire results with certain physician data, e.g., how did a particular specialty or age of physician answer which questions? This can be done by matching the questionnaires to the physician on file in the data bank of the Washington State Medical Education and Research Foundation through the physician's identification number. Several variables can be extracted from the data bank to cross-tabulate with the results of the questionnaire. Clarification of some of the answers received may best be done by personal interview or through another more specific questionnaire on a sampling basis. In any case, it is felt that more needs be done to make the results of this questionnaire as meaningful as practical.

SUMMARY HIGHLIGHTS

1. Of those physicians who attend courses and formal programs of continuing medical education, 71% are usually satisfied.
2. Twenty-one percent of the physicians in the state attend continuing education programs too infrequently to render an opinion on the subject.
3. For every critical comment on courses from those usually satisfied, ten comments of a critical nature were received from those who were only sometimes satisfied with those courses they had attended.
4. Four out of ten (39%) critical comments stated that the courses were not practical.
5. Almost two-thirds (58%) of the physicians can often find an interesting course to attend, one-third (33%) occasionally find an interesting course to attend, and only 8% rarely find an interesting course to attend.
6. Nearly half of the physicians say that the greatest deterrent to their attending courses is time, and it makes no difference whether the course is in state or out of state. (This certainly attests to the fact that we live in the jet age.)
7. Specialty group meetings rank highest in attendance, followed closely by one to three day symposia. Extensive postgraduate courses are attended least.
8. Specialty group meetings were ranked highest as to overall effectiveness, followed again by the one to three day symposia. County medical society meetings were rated as least effective.
9. Specialty journals were rated tops as a medium in "keeping up". Tel-E-Med was a distant last, with medical educational television and motion pictures only slightly better.

10. One out of three physicians had suggestions as to subjects which have not received sufficient attention in continuing medical education programs. The practical aspects of practicing medicine were thought to be slighted most. There also are a large number of doctors who think that more courses should be aimed specifically at the general practitioner.

11. For the management of heart, cancer, and stroke, the greatest need, as the physicians see it for their own communities, is to eliminate the financial barriers to the availability of service. Diagnostic facilities were thought to be the least needed.

RESULTS OF THE QUESTIONNAIRE

QUESTION 1

1 With regard to continuing medical education courses and other formal programs currently being made available to you, *regardless of their sponsorship*, would you give your overall evaluation of the effectiveness of courses and other formal programs by checking one of the following statements:

Check One ☐ a I am *usually* satisfied with those I have attended.

☐ b I am only *sometimes* satisfied with those I have attended.

☐ c I *don't attend* them often enough to make an evaluation.

Comments: ______________________________

Answers to this first question provide insight into the degree of satisfaction which physicians generally obtain from having taken continuing medical education courses and how effective the physicians think these courses are.

More than half (55%) of the physicians in the survey indicated that they were usually satisfied with those courses and formal programs they had attended. Twenty-two percent answered that they were only sometimes satisfied, and 21% answered that they don't attend often enough to make an evaluation.

Twenty-one percent of those who answered Question 1 also provided comments. Those who were usually satisfied seemed to attach importance to selectivity. Eighty specifically mentioned that they were selective in the courses they attended. Only fourteen were critical of the programs they had attended. Eleven of the fourteen made the comment that courses were too didactic and three commented that they were too specialized.

On the other hand, 124 of those who answered that they were only sometimes satisfied lent criticism. The comments follow:

Comments	Number
Not of practical value	54
Too elementary	20
Poorly prepared	10
Too general	7
Repetitious	7
Too esoteric	6
Poorly presented	6
Stereotyped	6
Too social	5
Teachers often promoting selves	3

Of the 689 (21%) who answered that they don't attend often enough to make an evaluation, 164 made comment as to why they do not attend. These comments will be combined with the comments to Question 3 d, "Other reasons why you seldom attend such courses and programs."

From this group of physicians who said that they didn't attend courses and programs often enough to make an evaluation, some did go right ahead and evaluate parts of Questions 2 and 4. Following is the detail:

Question 2

"I often find an interesting course to attend."
6% said "In State"
10% said "Out of State"
19% said "Both In State and Out of State"

"I occasionally find an interesting course to attend."
11% said "In State"
9% said "Out of State"
18% said "Both In State and Out of State"

"I rarely find an interesting course to attend."
7% said "In State"
2% said "Out of State"
8% said "Both In State and Out of State"

Question 4 (They were asked to leave blank any which they did not attend.)

44% evaluated One to Three Day Symposia
26% evaluated Circuit Courses
50% evaluated Regular Recurring Hospital Programs

How these physicians evaluated the above continuing education media and how their evaluation compared with the evaluation of the physicians who said they attend courses and fomal programs is discussed in the section dealing with Question 4.

QUESTION 2

2 With regard to the subject matter offered in postgraduate courses or other formal programs, would you make an overall evaluation by checking one of the following statements:

☐ a I *often* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

Check All Applicable

☐ b I *occasionally* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

☐ c I *rarely* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

This question pertains to the availability of courses, in state and out of state.

The question is somewhat difficult to evaluate because the physicians were asked to check all statements applicable and as a consequence, the 3,364 who answered checked 3,645 statements. Of the 3,645 statements checked, 2,124 (58%) were under 2 a, "I often find an interesting course to attend", 33% of the checks were under 2 b, "I occasionally find an interested course to attend", and 8% were under 2 c, "I rarely find an interesting course to attend".

A further breakdown of the answers follows:

2 a. I often find an interesting course to attend: (2,124 answered)
13% answered "In State"
19% answered "Out of State"
67% answered "Both In State and Out of State"

2 b. I *occasionally* find an interesting course to attend: (1,213 answered)
30% answered "In State"
16% answered "Out of State"
54% answered "Both In State and Out of State"

2 c. I *rarely* find an interesting course to attend: (308 answered)
43% answered "In State"
11% answered "Out of State"
46% answered "Both In State and Out of State"

How Question 2 was answered depended somewhat on how Question 1 was answered. A larger portion of those who were *usually satisfied* with courses they had attended *often* find interesting courses to attend than those who are *only sometimes satisfied* with courses they have attended. Of the latter group, a larger percentage only *occasionally* find an interesting course to attend than from among those who are *usually satisfied* with those they have attended. Here is how the two groups evaluated Question 2:

"I *often* find an interesting course to attend."

Those who in Question 1 stated that they were:	In State	Out of State	Both In and Out of State
Usually satisfied	17%	17%	52%
Sometimes satisfied	7%	16%	34%

"I *occasionally* find an interesting course to attend."

	In State	Out of State	Both In and Out of State
Usually satisfied	13%	7%	16%
Sometimes satisfied	18%	11%	34%

"I *rarely* find an interesting course to attend."

	In State	Out of State	Both In and Out of State
Usually satisfied	4%	1%	1%
Sometimes satisfied	7%	1%	2%

QUESTION 3

3 Regardless of interest, I seldom attend such courses or programs because of inconvenience due to:

Check One or More

☐ a Time
☐ b Locale
☐ c Costs, such as
  ☐ 1 tuition
  ☐ 2 other direct costs (travel, hotel accommodations)
☐ d Other reasons why you seldom attend such courses and programs.

(please specify)____

This question dealing with the barriers to attending courses was answered by 2,610 physicians. The results:

1,237 (47.39%)	checks for "Time"
372 (14.25%)	checks for "Locale"
435 (16.66%)	checks for "Costs, such as"
268 (10.26%)	checks for "Tuition"
366 (14.02%)	checks for "Other direct costs"

They were invited to check one or more and they did provide 2,678 checks. Further programming on the computer will eliminate the checks for 3 c, which duplicate checks in 3 c1 and 3 c2.

The inconveniences itemized in this question which cause scanty attendance to programs and courses were cross-checked with the answers in Question 2 with these results:

A. The percentage of those who said time was an inconvenience:

38% of the 401 who said they often find an interesting course to attend in state

39% of the 508 who said they often find an interesting course to attend out of state

44% of the 1,359 who said they often find an interesting course to attend both in and out of state

50% of the 460 who said they occasionally find an interesting course to attend in state
43% of the 274 who said they occasionally find an interesting course to attend out of state
54% of the 684 who said they occasionally find an interesting course to attend both in and out of state

37% of the 203 who said they rarely find an interesting course to attend in state
43% of the 60 who said they rarely find an interesting course to attend out of state
64% of the 103 who said they rarely find an interesting course to attend both in and out of state

By merely adding the percentage points from among the three levels of evaluation, i.e., often, occasionally, rarely, of Question 2, we find that for those who often find an interesting course to attend, the points total 121. For those who occasionally find an interesting course to attend, the points total 147, and for those who rarely find an interesting course to attend, 144. Thus it may be said that time seems to be considered a slightly greater hindrance to attending courses for those who occasionally find an interesting course to attend than for those who rarely find an interesting course to attend, and a substantially greater hindrance than for those who often find an interesting course to attend.

By adding the percentage points for in state (38, 50, and 37), and the percentage points for out of state (39, 43, and 43), both totals equal 125. So it seems that the physicians rate time just as much a deterrent to attending courses in state as out of state.

B. The percentage of those who said locale was an inconvenience:

13% of the 401 who said they often find an interesting course to attend in state
17% of the 508 who said they often find an interesting course to attend out of state
12% of the 1,359 who said they often find an interesting course to attend both in and out of state

17% of the 460 who said they occasionally find an interesting course to attend in state

20% of the 274 who said they occasionally find an interesting course to attend out of state

18% of the 684 who said they occasionally find an interesting course to attend both in and out of state

24% of the 203 who said they rarely find an interesting course to attend in state

28% of the 60 who said they rarely find an interesting course to attend out of state

31% of the 103 who said they rarely find an interesting course to attend both in and out of state

By adding the percentage points among the three levels of evaluation of Question 2, (see above)

Often 13 + 17 + 12 = 42
Occasionally 17 + 20 + 18 = 55
Rarely 24 + 28 + 31 = 83

This suggests that locale is more a deterrent to attending courses as the level of satisfaction decreases.

Also, by adding the percentage points from the three levels of evaluation (see above) for

In State 13 + 17 + 24 = 54
Out of State 17 + 20 + 28 = 65

the result that locale is more a deterrent to attending courses out of state than in state is not surprising.

C. The percentage of those who said costs were an inconvenience:

"I often find an interesting course to attend."	In State	Out of State	Both In and Out of State
Costs, such as	13%	15%	17%
Tuition	13	11	12
Other Direct	9	14	16
Totals	35%	40%	45%

"I occasionally find an interesting course to attend."	In State	Out of State	Both In and Out of State
Costs, such as	16%	16%	19%
Tuition	11	12	10
Other Direct	14	14	16
Totals	41%	42%	45%

"I rarely find an interesting course to attend."

	In State	Out of State	Both In and Out of State
Costs, such as	20%	27%	19%
Tuition	30	41	16
Other Direct	29	45	24
Totals	79%	113%	59%

There is nothing unusual here, either. Costs are more an inconvenience to attending courses out of state than in state, and other direct costs are the primary cost factor. Costs were more meaningful to those who rarely find an interesting course to attend than for those in the other two categories and they listed many more other reasons why they seldom attend such courses and programs than either of the other two groups -- 164 for the rarely group, 98 for the often, and 91 for the occasionally group.

One hundred three physicians rendered comments to this question, but they also added that they do attend. Their comments were added to the comments from Question 1 pertaining to reasons for not attending courses and to the comments in this section (3 d - "Other reasons why you seldom attend such courses and programs.")

Subject of Comments	Number of Comments
Residency	136
Not related to specialty or interest	90
Time loss from practice	79
Military commitments	56
Intern	56
New practice	51
No adequate patient load coverage	48
Family commitments and responsibilities	36
Incompatible with schedule	35

Subject of Comments	Number of Comments
Solo practice	35
Prefers other methods of continuing medical education	26
Must attend too many specialty meetings	26
Not in private practice (federal, administrative, etc.)	25
Type of practice (OBG, PED, PSYCH, etc.)	18
Retired or semi-retired	16
Advanced age	14
Ill health	13
Fellow	9
Courses repetitious	7
Inertia	6
Courses too specialized	6
Mediocrity of courses	5
Church affiliation eliminates Saturday courses	4
Last minute notification	4
Too theoretical	3
Lack of scientific content	3
Courses not specialized enough	3
Procrastination	3
Lack of convenient parking	2

QUESTION 4

4 Would you please grade from 1 to 4 (1=best, 4=least valuable) the following courses and programs according to their overall effectiveness in your continuing medical education, *irrespective of convenience and costs.* (Please leave blank any which you do not attend.)

________ One to Three Day Symposia (University, Heart Assoc., Cancer Society, etc.)

________ Circuit Courses (University, Heart Assoc., Cancer Society, etc.)

________ Regular Recurring Hospital Programs (grand rounds, CPC, consultations, etc.)

________ County Medical Society (programs at meetings)

________ Annual Meeting Washington State Medical Association

________ Specialty Groups (meetings and annual programs)

________ Extensive Postgraduate Courses (two weeks to ten weeks or more in duration in specific fields)

________ Other (please specify and grade) ________________________________

____

As mentioned earlier, many of those who answered Question 1 that they "don't attend courses often enough to make an evaluation" nevertheless did offer evaluations of some of the items in this question, even though they were asked to leave blank any which they had not attended. Shown below, first, are the gross results and, second, the results eliminating the evaluations of those who said they didn't attend often enough to make evaluations.

Number Answered	Grade				Other*	
	1	2	3	4		
	Percent					
2433	45	33	13	8	1	One to Three Day Symposia
1427	18	32	26	21	3	Circuit Courses
2270	29	34	20	15	2	Regular Recurring Hospital Programs
2035	7	16	27	47	3	County Medical Society
1906	10	31	32	24	3	Annual Meeting Wash. State Med. Assoc.
2595	54	28	11	6	2	Specialty Groups
1396	43	17	10	24	6	Extensive Postgraduate Courses

* 401 mentioned "Other"

Number Answered	Grade				Other*	
	1	2	3	4		
	Percent					
2092	47	33	12	7	1	One to Three Day Symposia
1203	19	33	26	19	3	Circuit Courses
1877	28	34	21	16	2	Regular Recurring Hospital Programs
1743	7	16	28	47	3	County Medical Society
1669	10	31	32	24	3	Annual Meeting Wash. State Med. Assoc.
2099	54	28	10	6	2	Specialty Groups
1130	45	17	9	23	6	Extensive Postgraduate Courses

* 286 mentioned "Other"

In the final analysis, there is little difference in the two tables above.

The specialty groups and the one to three day symposia, followed by extensive postgraduate courses, seem to be most popular. The county medical society meetings rated the lowest, but there is perhaps good reason why they do. They are not restricted to the purpose of assisting in the continuing education process of the physician and they draw from the entire spectrum of the physician population. The Washington State Medical Association Annual Meeting is likewise not solely for the purpose of adding to or shoring up the education of the physician and has many other facets, such as Association business, social, and associations in many other ways, including the opportunity for physicians to talk to other physicians with whom they do not come in contact within their normal daily rounds.

QUESTION 5

5 What other media do you like to use in "keeping up" with your continuing medical education. Please grade from 1 to 4 (1=best, 4=least valuable)

________ General Journals (JAMA, G.P., etc.)
________ Throw-Aways (Medical World News, Modern Medicine, etc.)
________ Specialty Journals
________ Medical Texts
________ Audio Digest
________ Tel-E-Med
________ Medical Educational Television (such as Seattle Channel 9 medical programs)
________ Motion Pictures
________ Other (please specify and grade) ________

Question 5, an evaluation of other media in "keeping up", was graded as follows:

	Grade				Other *	
Number Answered	1	2	3	4		
	Percent					
2994	27	35	24	11	2	General Journals
2754	11	26	30	31	2	Throw-aways
2958	66	15	8	8	3	Specialty Journals
2550	25	39	22	12	2	Medical Texts
1288	25	19	15	35	6	Audio Digest
815	7	9	13	58	13	Tel-E-Med
1042	10	16	15	48	11	Medical Educational Television
1263	12	24	25	35	5	Motion Pictures

*A number larger than 4, a check mark, or other symbol

There really isn't much to say about the results to this question. The numbers of answers are relevant, as are the grades, and the percentage figures in the "Other" column are pertinent because there were about two to three percent of the physicians who used check marks or other symbols instead in assigning a numerical value from 1 to 4 as requested. Note that for the last four items listed, the percentage points are higher than the 2 to 3 in other cases. The differences are numbers assigned which were higher than 4 -- numbers such as 5, 6, 7, 8, or 9.

Comments (under "Other" [please specify and grade]) with their numbers are shown below:

Personal communication with informed colleagues	40
Medical and surgical clinics	12
Grand rounds	8
Specialty workshops	7
Detail men	7
Seminars and conferences	8
Monographs and reviews	5
"New England Journal of Medicine"	5
Local evening courses on various phases of medicine	4
"Year Book of Medicine"	3
ACP self-testing program	3
NME/TV tapes	3
Closed circuit TV	3
Library service for specific materials	3
In-Hospital meetings	2
Symposia	2
Audio tapes	2
Exhibits at meetings	2
Publications of leading pharmaceutical houses	2
"Northwest Medicine"	2
"Medical Economics"	2
"Review of Surgery"	1
"Hospital Practice"	1
Subject-related books (not texts)	1
Serving on hospital committees	1
Correspondence courses	1
"See Your Doctor" program	1

QUESTION 6

6 Are there any subject areas which you feel have not received sufficient attention in continuing education courses and programs?

Yes ☐ No ☐

If "Yes" would you please indicate these subject areas:

This question, dealing with other subject areas for study, brought in the most comments. Thirty-two percent in the survey gave comments. Subjects falling within the broad classification of the practice of medicine were the most numerous, followed by subjects dealing with medicine and society, and basic medicine. Quite a substantial number thought that more courses should be aimed at general practice. Some specific subjects mentioned were allergy, cardiology, dermatology, What's new?, and practical courses for the average practice. Subjects falling in the general area of basic science were also mentioned in goodly numbers.

The comments were too numerous to list here. They will be classified into several groups and included in Phase II of this study.

SPECIAL QUESTION

NOTE: The following question is not a part of the Questionnaire per se, but your answers to it will be greatly appreciated and most helpful.

What do you believe are the needs for increased emphasis *with regard to patient care* in your community in the management of heart disease, cancer and stroke. Please rank from 1 to 4 (1=greatest, 4=least need). Please leave blank any item with which you are not familiar.

		HEART				CANCER				STROKE			
RATING	=	1	2	3	4	1	2	3	4	1	2	3	4
		(1363) **				(1427) **				(1304) **			
Diagnostic facilities	%	18	18	19	44	23	18	19	39	19	17	19	43
		(1393)				(1256)				(1660)			
Rehabilitation facilities	%	28	30	21	19	23	25	24	25	56	24	9	8
		(1349)				(1260)				(1486)			
Trained ancillary personnel	%	31	30	20	17	23	30	22	23	46	34	13	10
		(1230)				(1249)				(1230)			
Physicians specially trained in:	%	17	17	20	44	18	23	20	37	22	23	19	34
		(1296)				(1318)				(1312)			
Treatment facilities	%	18	22	23	36	18	27	23	31	27	28	21	23
		(1364)				(1454)				(1467)			
Elimination of financial barriers to the availability of service	%	33	20	21	21	40	22	16	17	39	22	18	16
		(219) mentioned "Other"				(220) mentioned "Other"				(278) mentioned "Other"			

Note: Percentages will not necessarily equal 100%, because ratings other than those of 1 - 4 are not shown.

** Number of physicians evaluating question.

This special question was added to the original questionnaire and proves to be quite interesting. It did not draw as many answers as some of the other questions, but it was on the back where some may have overlooked it and, more important, these diseases are not dealt with by all physicians.

Cancer received the most evaluations in three of the seven items, and Stroke received the most evaluations in four out of seven items.

For the management of heart, cancer, and stroke, the needs, as seen by the physicians in their own communities, were: (from top to bottom of the list are the greatest to the least need.)

1. Elimination of financial barriers to the availability of service.
2. Rehabilitation facilities.

3. Trained ancillary personnel.
4. Treatment facilities.
5. Physicians specially trained.
6. Diagnostic facilities.

For the management of these three diseases individually, the needs in the communities as seen by the physicians were:

(1 = greatest need, 6 = least need)

HEART	CANCER	STROKE	
1	1	1	Elimination of financial barriers
3	3	1	Rehabilitation facilities
2	2	2	Trained ancillary personnel
4	4	4	Treatment facilities
5	5	5	Physicians specially trained
5	5	6	Diagnostic facilities

There were a meaningful number of comments to this question, and they are enumerated below.

Facilities seem adequate	87
Need for:	
Regional facilities centers	21
Psychiatric rehabilitation	16
Extended care facilities	14
Rehabilitation facilities	9
Coronary care units	5
Occupational rehabilitation	3
Expansion and upgrading of existing facilities	2
Local medical control over needed facilities	1
Consultation facilities	1
Special care units	1
Cobalt units	1
Home services	11
Convalescent centers	9
Geriatric care	2
Teaching of family members for home care	1
More general physicians	30
Physicians specially trained in:	
Neurosurgery	9

Neurology	8
Radiology	3
Surgery	3
Internal Medicine	2
Anesthesiology	2
"After Hours Clinic" operated on rotating-physician basis	1
Education of physicians in newer concepts of treatment and technical competence	31
Preventive measures and research	16
Newer laboratory studies	3
Studies on prophylactics	1
Isotope scanning	1
Lymph angiography	1
Education of public	23
Education of patient	11
Better use of ancillary personnel	14
Physicist	1
Speech therapists	1
Cohesive planning and organization	8
Staff conferences with qualified outside personnel	2
Quality control	2
Inter-Agency (including MD) communication	1
Adequate retrievable records	1
Elimination of vested interests which now prevent patient from getting available care	1

COMMENTS PERTAINING TO THE SCHOOL OF MEDICINE, UNIVERSITY OF WASHINGTON

Questions 1, 3, 4, and 6 drew almost a hundred comments concerning the continuing medical educational efforts of the University of Washington's School of Medicine.

In recent years, and more and more each year, the University of Washington has been looked to by the medical profession to play a leading role in the continuing medical education of its members. The University has responded, even though it has never received budget consideration from the State Legislature for this purpose. Its efforts in this area must, of necessity, be supported by tuition charged for the courses it offers. Because of land limitations, greatly expanded staff and student body, the University also has had to build expensive parking facilities. These facilities must be paid for out of revenue generated by them. All who use must pay -- students, staff, and visitors. Thus it was not unexpected that some comments were directed toward the cost of parking and fees for attending classes.

To make this survey as useful as possible, all comments concerning the University were extracted verbatim (but without identification of the author) and given to the Dean of the School of Medicine. This at least will give him an opportunity to weigh some of the thoughts of whose who have attended his courses. Some of the comments were complimentary, some were not, but all will be carefully considered.

APPENDIXES

Appendix A. . . . . . . The Clerical Operation and Budget
Appendix B. . . . . . . The Questionnaire
Appendix C. . . . . . . Paper Supplies

APPENDIX A

THE CLERICAL OPERATION AND BUDGET

The purpose of this section is to present some of the clerical details of this survey so others planning to conduct their own surveys may consider what we have done. This is with the thought that it is well to profit by the mistakes of others, because one won't live long enough to make them all himself.

The questionnaire (see Appendix B), including the letter of transmittal, is all on one sheet of paper folded to four pages. This we thought important to prevent losing parts of the questionnaire and for ease of handling. The questionnaire was ordered from an outside printer to be delivered folded to fit in a Number 10 size window envelope along with a pre-addressed postage free envelope (Number 9). (See Appendix C for supplies.) First class mail was used.

Three labels were printed for each address. One was for the first mailing and the second served as a tickler file. As questionnaires were received back in the office, the corresponding second labels were removed from the file and destroyed. The labels remaining in the second file were then used to address the second mailing. The third set of labels was used to mail the results of the questionnaire.

The mailing address labels are the self-adhesive, size 3 1/2" x 15/16", and are packaged 5,000 per box. We addressed our labels with a printer under command of an IBM 7040/7094 computer system.

The addresses were obtained from the Medical Mailing Service, Inc., 426 S. Clinton Street, Chicago, Illinois 60607. This is one of the nine or ten companies authorized by the American Medical Association to maintain and rent the master list of physicians. In our case we bought the list of Washington State physicians on a magnetic tape which cost $250.00 and agreed to certain restrictions as to its use.

The mailing of the questionnaires began on March 25 and ended on May 3. At first the questionnaires came back rather quickly and in good numbers. By the time 54% were returned, the second mailing began to all who had not returned the questionnaire from the first mailing. The questionnaires in the second mailing had a small 4 1/4" x 5 1/2" second notice attached by inserting it partly under the mailing label.

Even as late as the last week of September questionnaires dribbled in, one at a time, but those received after July 18 have not been included in the final results.

As the questionnaires were returned, the corresponding second labels were pulled from the tickler file. The questionnaires were then sorted into one of two groups. If they contained no remarks, change of address, or any other notes, they were placed in one group ready for key punching. If the questionnaires were returned with notes, remarks, or change of address, action was taken immediately to update our files or to record the remarks or notes. From each pile, batches of questionnaires were counted and sent to key punch. When batches were returned, their count was verified to guard against loss. Of course, exact instructions were written for the key punch operators and a high degree of quality control imposed.

The results of the first 689 completed questionnaires were processed through the computer to see that there were no programming faults. It may be of interest to the reader to note that the results from these first 689 were very close to the final results.

At this time the accounting is not complete, but the actual expenses are known to be about $1,000.00 below the budget. Most of the savings were realized in salaries. Also, it was found unnecessary to engage a consultant, thus saving $300.00. The final accounting for the survey will appear in the reporting of Phase II. The budget for the project is on the following page.

BUDGET

February 1, 1968 - May 31, 1968

SALARIES		
1 Clerk, 4 months full time @ $375.00 month	$1,500.00	
1 Typist, 2 weeks full time @ $90.00 week	180.00	
1 Manuscript Editor, 2 weeks full time @ $116.00 week	232.00	
1 Supervisor, 4 months 1/5 time @ $150.00 month	600.00	
1 Project Coordinator, 4 months 2/5 time @ $433.00 month	1,732.00	
Total Salaries		$4,244.00
INDIRECT COSTS @ 21.5% of direct salaries		913.00
EMPLOYEE BENEFITS - Retirement, Social Security, Medical Aid, and Health Insurance Premiums		509.00
CONSULTING SERVICE		
4 days @ $75.00 per day		300.00
SUPPLIES & MATERIALS		
General (Office Supplies)	191.00	
Postage	818.00	
Total Supplies and Materials		1,009.00
EQUIPMENT		
Computer tape with names and addresses		250.00
PUBLICATIONS		
Special Report (Survey results of 20 pages)	800.00	
Other (Questionnaire of 4 pages)	475.00	
Total Publications		1,275.00
OTHER		
Illustrations		250.00
AMOUNT REQUESTED		$8,750.00

APPENDIX B

Washington State Medical Association
4444 N.E. Ravenna Boulevard
Seattle, Washington 98115
Lakeview 3-9110

THE QUESTIONNAIRE

180359016 ⟵ (Identification Number)
GEO. ALVIN OJEMMO, M.D.
1632 N. E. 12 AVE.
SEATTLE, WASHINGTON 98105

Dear Professional Colleague:

I would like very much for you to complete the following questionnaire and return it to my office in the enclosed postage paid envelope.

This questionnaire has been pre-tested with fifty physicians in private practice selected at random from the Washington State Medical Association's membership files. It was generally felt that the questionnaire was uncomplicated, easy to answer, and inoffensive. I hope that you, too, will agree, for the information we gain will be helpful in assessing future needs in the area of continuing medical education.

Your name appears on the questionnaire. We will not single out anyones' reply, but we do need the name so that we may use it in grouping replies by specialty of practice, how long in practice, age group, region, etc.

Results of the questionnaire will be distributed to all physicians in the State of Washington for their information, so please help me to make the results meaningful by replying soon.

Sincerely,

Roland D. Pinkham

ROLAND D. PINKHAM, M.D.
President
WASHINGTON STATE MEDICAL EDUCATION
AND RESEARCH FOUNDATION

RDP:jgp

STUDY OF CONTINUING EDUCATION

in a joint effort of the

WASHINGTON STATE MEDICAL EDUCATION AND RESEARCH FOUNDATION

and the

WASHINGTON-ALASKA REGIONAL MEDICAL PROGRAM

PHASE I —Some Opinions of Physicians on Continuing Education

1 With regard to continuing medical education courses and other formal programs currently being made available to you, *regardless of their sponsorship*, would you give your overall evaluation of the effectiveness of courses and other formal programs by checking one of the following statements:

Check One

☐ a I am *usually* satisfied with those I have attended.
☐ b I am only *sometimes* satisfied with those I have attended.
☐ c I *don't attend* them often enough to make an evaluation.

Comments: ____________________
____
____

2 With regard to the subject matter offered in postgraduate courses or other formal programs, would you make an overall evaluation by checking one of the following statements:

Check All Applicable

☐ a I *often* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

☐ b I *occasionally* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

☐ c I *rarely* find an interesting course to attend.
  ☐ In State ☐ Out of State ☐ Both in State and Out of State

3 Regardless of interest, I seldom attend such courses or programs because of inconvenience due to:

Check One or More

☐ a Time
☐ b Locale
☐ c Costs, such as
  ☐ 1 tuition
  ☐ 2 other direct costs (travel, hotel accommodations)
☐ d Other reasons why you seldom attend such courses and programs.

(please specify) ____________________
____
____

4 Would you please grade from 1 to 4 (1=best, 4=least valuable) the following courses and programs according to their overall effectiveness in your continuing medical education, *irrespective of convenience and costs.* (Please leave blank any which you do not attend.)

________ One to Three Day Symposia (University, Heart Assoc., Cancer Society, etc.)

________ Circuit Courses (University, Heart Assoc., Cancer Society, etc.)

________ Regular Recurring Hospital Programs (grand rounds, CPC, consultations, etc.)

________ County Medical Society (programs at meetings)

________ Annual Meeting Washington State Medical Association

________ Specialty Groups (meetings and annual programs)

________ Extensive Postgraduate Courses (two weeks to ten weeks or more in duration in specific fields)

________ Other (please specify and grade) ________________

____

5 What other media do you like to use in "keeping up" with your continuing medical education. Please grade from 1 to 4 (1=best, 4=least valuable)

________ General Journals (JAMA, G.P., etc.)

________ Throw-Aways (Medical World News, Modern Medicine, etc.)

________ Specialty Journals

________ Medical Texts

________ Audio Digest

________ Tel-E-Med

________ Medical Educational Television (such as Seattle Channel 9 medical programs)

________ Motion Pictures

________ Other (please specify and grade) ________________

____

____

6 Are there any subject areas which you feel have not received sufficient attention in continuing education courses and programs?

Yes ☐ No ☐

If "Yes" would you please indicate these subject areas: ________________

________________ ________________ ________________

________________ ________________ ________________

________________ ________________ ________________

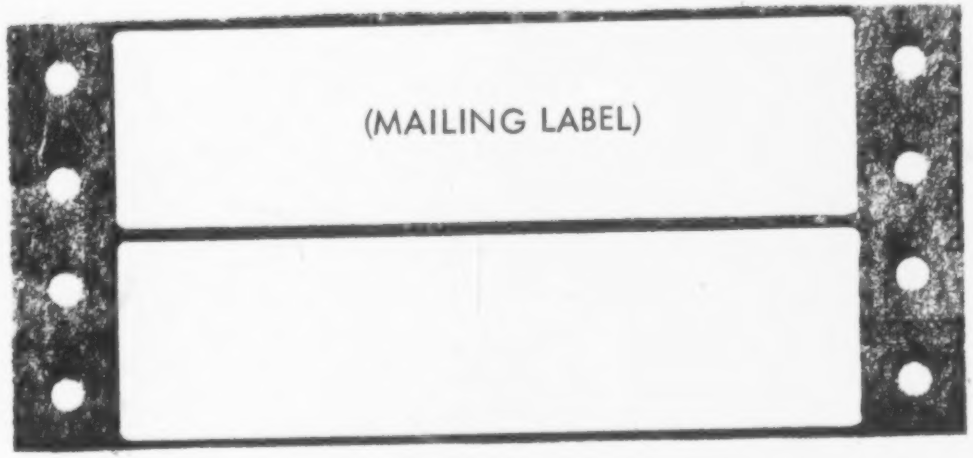
SPECIAL QUESTION

NOTE: **The following question is not a part of the Questionnaire per se, but your answers to it will be greatly appreciated and most helpful.**

What do you believe are the needs for increased emphasis *with regard to patient care* in your community in the management of heart disease, cancer and stroke. Please rank from 1 to 4 (1=greatest, 4=least need). Please leave blank any item with which you are not familiar.

	HEART	CANCER	STROKE
Diagnostic facilities			
Rehabilitation facilities			
Trained ancillary personnel			
Physicians specially trained in:			
Treatment facilities			
Elimination of financial barriers to the availability of service			
Other (please specify and rank)			

APPENDIX C

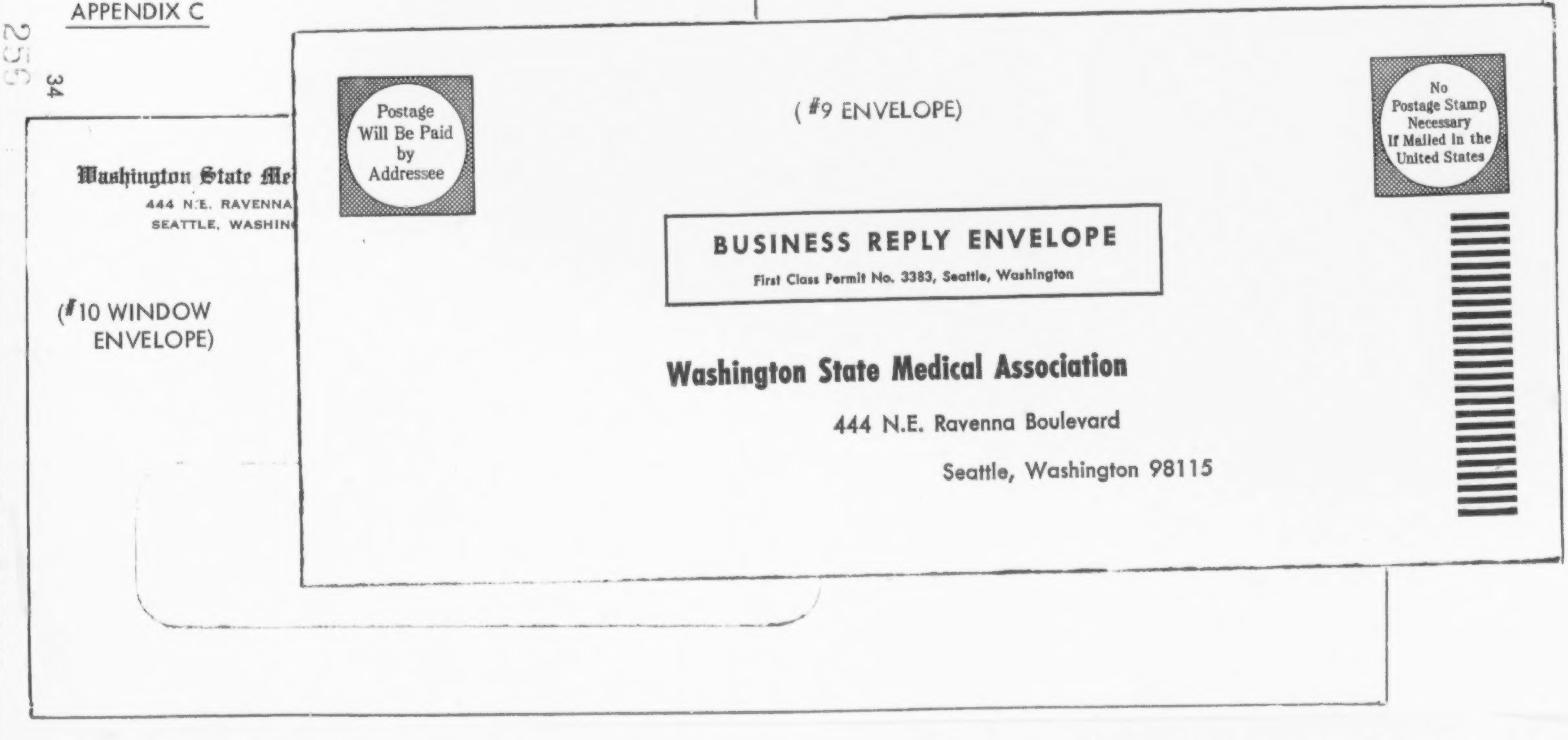


2nd NOTICE

A short time ago Doctor Pinkham, President of the Washington State Medical Education and Research Foundation, wrote to ask that you complete a questionnaire concerning Continual Medical Education needs for physicians. We have not received the completed questionnaire from you, so we are sending another in the hope that you will, at your early convenience, complete and return it to this Office. We shall appreciate it.

Sincerely,

RICHARD F. GORMAN



Washington State Me
444 N.E. RAVENNA
SEATTLE, WASHIN

(#10 WINDOW ENVELOPE)

(#9 ENVELOPE)

Postage Will Be Paid by Addressee

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BUSINESS REPLY ENVELOPE
First Class Permit No. 3383, Seattle, Washington

Washington State Medical Association
444 N.E. Ravenna Boulevard
Seattle, Washington 98115

APPENDIX E

INDIVIDUAL COMMENTS ON QUESTIONS FROM REGION WIDE SURVEY OF PHYSICIANS

(WSMA Survey)

COMMENTS-QUESTION 1

Usually satisfied

Selective in courses attended:	80
Application not practical:	15
Too didactic:	11
Not in private practice:	7
Too specialized:	3
Prefers circuit courses:	1

Only sometimes satisfied

Courses not of practical value:	53	Stereotyped:	6
Too elementary:	20	Too social:	5
Poorly prepared:	10	Intern or Resident:	5
Too general:	7	Teachers often promoting selves:	3
Repetitious:	7		
Too esoteric:	6		
Poorly presented:	6		
Suggests small groups:	1		

Don't attend often enough to make evaluation, BECAUSE:

Resident	40
New practice or new to area	29
Specialty meetings mostly	24
Intern	21
Military service	17
Prefer other means of c.m.e.	7
Too specialized	5
Fellow	4
Retired	4
Government employed	3
Poor health	3
No patient coverage	2
Family commitments	2
Hospital based MDs and consultants come to hospital to lecture, etc.:	2
Near retirement	1
More convenient to attend in Portland	1

COMMENTS-QUESTION 3

Regardless of interest, I seldom attend because of inconvenience due to: (Time, Locale, Costs, were keypunched)

OTHER

I DO ATTEND (Most of these commented on the inappropriate wording of the question): 103

In residency	96
Not related to specialty or interest	90
Time loss from practice	79
Not adequate pt. load coverage	46
Military commitments	39
Incompatible with schedule	35
Solo practice	34
Family commitments and responsibilities	34
Intern	30
Not in private practice (Federal, state, adm.)	22
New practice	22
Prefers other methods of c.m.e.	19
Type of practice (OB, Ped., Psych., etc.)	18
Advanced age	13
Poor health	10
Courses repetitious	7
Semi-retired	6
Retired	6
Inertia	6
Mediocrity of course	5
Fellow	5
Church affiliation eliminates Sat. courses (SDA)	4
Last minute notification	4
Too theoretical	3
Lack of scientific content	3
Procrastination	3
Not esoteric enough	3
Must attend too many specialty meetings	2
Lack of convenient parking	2
Too specialized	1

COMMENTS-QUESTION 4

Would you please grade from 1 to 4 the following courses and programs according to their overall effectiveness in your c.m.e., irrespective of convenience and costs: (Keypunched).

OTHER

Short PC courses (3-4 days)	36
Specialty courses at various teaching centers, in and out of state	31
Specialty workshops and clinics	13
Clinical session AMA	7
Small group discussions with authorities in various fields	6
Seminars	5
Carefully structured preceptorships	5
Conversations with colleagues	4
Weekly courses at Green River Community College	4
Closed circuit TV	4
Specialty material on tape, slides, etc.	3
Sub-specialty Journal Club	3
Correspondence courses from various medical schools	2
Overseas conferences	2
Regularly recurring hospital programs	2
Blue Cross	1
Lederle Symposia	1
Current literature	1

COMMENTS-QUESTION 5

What other media do you like to use in keeping up with your c.m.e.?

OTHER

Personal communication with informed colleagues	40
Medical and surgical clinics	12
Grand Rounds	8
Specialty workshops	7
Detail men	7
Seminars	5
Monographs and reviews	5
"New England Journal of Medicine"	5
Local evening courses on various phases of medicine	4
Year Book of Medicine	3
ACP self-testing program	3
NME/TV Tapes	3
Closed circuit TV	3
Conferences	3
Library service for specific materials	3
In-Hospital meetings	2
Symposia	2
Audio tapes	2
Exhibits at meetings	2

Publications of leading pharmaceutical houses	2
"Northwest Medicine"	2
"Medical Economics"	2
"Review of Surgery"	1
"Hospital Practice"	1
Subject-related books (not texts)	1
Serving on hospital committees	1
Correspondence courses	1
"See Your Doctor" Program	1

COMMENTS-QUESTION 6

...Subject areas which you feel have not received sufficient attention in c.m.e. courses and programs.

Abortions and contraceptives, advances in	1
Abortion laws	1
Administrative medicine	1
Adolescence	1
Adoption problems	1
Air pollution	1
Alcoholism	9
Allergy	10
Allergy for the GP	4
Anatomy	5
Anemia, diagnosis before treatment	1
Anesthesiology	4
Arterial angiography, techniques of	1
Arthritis	6
Audio tapes which can be checked out from medical libraries	1
Automation in laboratory and clinical medicine, Impact of	2
Basic clinical medicine and surgery	1
Basic Sciences reviews and advancements	31
"Backache"	2
Biochemistry	1
Biostatistics	2
Cancer-	
Detection	2
Management of inoperable cancer	2
Cancer surgery, Basic principles of	1
Rx review courses	1
Cancer chemotherapy	2
Bronchogenic carcinoma	1
Cancer of the male genitalia and its incidence and discovery by average physician	1

Cardiology	10
Cardiology for the GP	4
Cardiovascular surgery, Surgical judgment in	1
Chest	2
Child development and learning	8
Child guidance	2
Childhood infectious diseases	2
Civil defense	1
Clinical sessions with patients	1
Community services available for optimal patient care	1
Connective tissue diseases	1
Coronary care	4
Counseling-	
Family	1
Marital	4
Cytology	1
Death investigation	1
Dermatology	15
Dermatology for the GP	11
Diabetes	3
Diagnostic medicine	17
Disability evaluation, MD's role in	1
Disaster planning	1
Drugs-	
Drug therapy	14
Use and misuse of tranquillizers, hormones, antibiotics, etc.	4
New drugs	2
Immediate and long term therapy of pre- and post-adolescent drug users (LSD, etc.)	1
ECG interpretation	1
Education, Need for stressing adequate education and avoidance of romantic and sexual entanglements in early life	1
EKG courses, postgraduate	2
Electronic equipment, use of advanced	3
Emergency management and care of patients	9
Emotional aspects of unwanted pregnancey, sexual delinquency, etc.	1
Emotional factors in disease	1
Emphysema	1
Endocrinology	11
ENT	9
Environmental health	1
Environmental medicine as it pertains to specialties	1

Enzymology	1
Epilepsy	1
Euthanasia	1
Family practice	2
Family planning	4
Fees and relative values	2
Fetal mortality	1
Fluid-electrolyte balance	12
Foot problems, diagnosis and treatment of	1
Forensic medicine	4
Functional disturbances	1
Functional illness vs. somatic illness	1
Gastrointestinal diseases	2
General Medical and Surgical updating	1
General Practice-emphasis on developing more GPs	1
General Practice	26
Written tests for GPs in various specialties to point up need for remedial study	1
Every area of medicine as it relates to General Practice	1
"What's New" courses designed for General Practice	1
Practical courses for average practice	2
G-U	1
Geriatrics	1
Group Practice	3
Office gynecology	3
Health education via mass media for patients	1
Hematology	3
Hospital procedures, New techniques	2
Humanities	1
Hypersensitivity	1
Hypertension	1
Hypertension, Surgical aspects of	1
Hypnosis	2
Iatrogenic disease	3
Immunology	5
Industrial medicine	1
Infectious diseases	1
Inhalation therapy	1
Insurance	2
Internal Medicine	8
Intra-specialty interests	3

Laboratory procedures, new	1
Laboratory tests and their diagnostic limitations	1
Laboratory quality control program material	1
Laboratory tests and their usefulness	3
Lay participation in courses (behavior problems, etc.)	1
Legislation, Medical	2
Malpractice	3
Medical aspects of sports	4
Medical care, delivery system of	3
Medical communication (writing and speaking), The art of	3
Medical economics	44
Medical ethics	10
Medical forms, Completion of, simplified and standardized	1
Medical politics	5
Medicare	1
Medicine, changes in basic techniques of	2
Medico-Legal instruction	20
Mental health	1
Mental health, preventive	2
Mental retardation	3
Microbiology	1
Modern technology, Application of, to medicine	5
Multiple injuries and shock, Management of	1
Mycology	1
Myocardial infarction, Management of	2
Nephrology	1
Neurology	14
Neuropsychiatry	2
Neuroses, Management of minor	1
Newborn problems	4
Nuclear medicine	3
Nutrition	1
Obesity	4
OBG	10
Occupational medicine	1
Office management	5
Office procedures, practical aspects of	16
Ophthalmology	5
Orthopedics	11
Orthopedics for the GP	6
Otolaryngology	2
Otology	1

Pain, Rx	3
Panel discussions of everyday problems	2
Pap. smear, techniques of (by clinicians)	1
Paramedical disciplines, Physician's relationship to	1
Paramedical education in all facets of medical profession	1
Parasitology	1
Pathology	13
Pediatrics	7
Pharmacology	14
Physical fitness	3
Physical medicine/Rehabilitation	4
Physician exchange programs	2
Physician's obligation to society (involvement in programs other than medicine)	6
Physician participation in new procedures, techniques, etc.	4
Physician-Patient relationship	5
Physician's role in problems of youth and sex	1
Physician's role in society, Re-evaluation of, as health planner rather than health care dispenser	4
Physiology - review	20
reproductive	1
Postmortems	1
Prenatal care, Re-evaluation of traditional	1
Pre-operative preparation and post-operative care	3
Preventive aspects of degenerative dieeases	1
Preventive medicine	10
Proctology	3
Proctosigmoidoscopy	1
Professional Courtesy: Does it compromise patient care	1
Psoriatic patients, Treatment for	1
Psychiatry	39
Psychiatry in General Office Practice	21
Psychophysiology	2
Psychosomatic Medicine	4
Pulmonary diseases and therapy	11
Radiation therapy	1
Radiology	9
Renal diseases	1
Respiratory diseases	2
Resuscitation	1
Screening equipment, Personalized instruction in use of	1

Semantics	1
Seminars	1
Sexuality and human relations	3
Social medicine	1
Socio-Medical issues (drug abuse, sex education, VD, etc.)	16
Specialty courses designed for specialist rather than GP	2
Speech development	1
Strokes	2
Surgery-	
General	4
Minor	2
Surgical techniques, New	21
Thyrotoxicosis	2
Toxicology	1
Toxicology, Industrial	1
Transplantation	2
Trauma	11
Tumor therapy	1
Urology	2
Vascular disease	1
Vascular surgery	1
Vehicle safety	2
Viral diseases	3
X-ray	2

OTHER COMMENTS

Importance of family physician on health care team.	1
Make AMA more effective in helping practicing M.D.	1
How to combat bad publicity and sensationalism in lay journals.	1
Efficient use of medical care and manpower.	1
Liaison between Industrial and General medical practice.	1
Hospital vs. home management of patients.	1
Instruction in placing of an internal pacemaker	1
Religion and Medicine.	3
Home study sessions with follow-up at University.	1

Application of advancements in educational techniques (audio-visual aids, etc.)	1
Greater fraternization among MDs.	1
Correlation of specialties to general health.	1
Actual technical demonstration and scrub-ins.	2
"How to Unlearn"	1
Through Ford, or similar foundation grants, after ten years of practice physician could be placed back in original residency for 4 to 6 months without having financial worries while he is being retrained in new techniques, etc.	1
Joint practice and residency (earn 1/2 time, learn 1/2 time)	1

COMMENTS-SPECIAL QUESTION

OTHER:

Facilities seem adequate	87
Need Regional Facilities centers	21
Rehabilitation facilities	9
Psychiatric rehabilitation	16
Occupational rehabilitation	3
Extended Care facilities	14
Expansion and upgrading of existing facilities	2
Local medical control over needed facilities	1
Consultation facilities	1
Coronary care units	5
Special care units	1
Cobalt units	1
Convalescent centers	7
Nursing homes	2
Home services	11
Geriatric care	2
Teaching of family members for home care	1
Availability of house staff	1
Need more general physicians	29
Need physicians especially trained in: Neurology 8 Neurosurgery 9 Radiology 3 Surgery 3 Internal Medicine 2 Anesthesiology 2	
"After Hours" Clinic operated on rotating-physician basis	1

Education of physicians in newer concepts of treatment and technical competence	31
Preventive measures and research	16
Newer laboratory studies	3
Studies on prophylactics	1
Isotope scanning	1
Lymph angiography	1
Education of public	23
Education of patient	11
Better use of ancillary personnel	14
Need physicist	1
Need speech therapists	1
Cohesive planning and organization	8
Staff conferences with qualified outside personnel	2
Quality control	2
Inter-Agency (including MD) communication	1
Adequate retrievable records	1
Elimination of vested interests which now prevent patient from getting available care	1

APPENDIX F

University of Washington
School of Medicine
Seattle, Washington

THE CME SHORT COURSE*

by

Charles W. Dohner, Ph.D.
Director, Office of Research in Medical Education

and

Ronald L. Hamberg, B.A.
Research Assistant, Office of Research in Medical Education

---

* This work was supported in part by Public Health Service Contract No. PH108-66-177.

The purpose of this study is threefold: 1) to measure the reaction of participating physicians to the content and instruction of a short course; 2) to review the expressed reasons for their either attending or not attending a short course; and 3) to see if, after participating in this short course, any stated changes in practice occurred.

The exact description of a short course is not fixed. A report by the Bureau of Research and Planning Committee of the California Medical Association on continuing medical education indicates that "two- or three-day symposia are considered the most valuable modality" (6). In this study, a short course is defined as being five days or less in length, concentrated or continuous, and less than 40 hours in duration.

The importance of information about the short course is seen by its extensive use in the United States and the lack of study of its effect on practice or knowledge changes, despite the fact that one survey reports "most physicians acquire the medical information which they need by attending. . .seminars or by reading texts and journals" (4). Approximately 47 per cent of the courses listed in the Journal of the American Medical Association's annual review of continuing medical education in the United States for 1968-69 meet the above definition of short course (5). While the short course, along with other continuing educational programs, has been increasing in use there has been little investigation and some questioning of its efficacy. Williams ranks short courses as least important among five basic forms of continuing education methods (6). Manning et al note that "In fact, there is little or no evidence that behavior is changed by attendance at conventional postgraduate courses" (3). Although this statement is not directed specifically at the short course only, the method certainly is included.

The most frequently encountered criteria for measuring effectiveness of postgraduate courses are attendance, gain in knowledge, value, or satisfaction. Very little is usually done about measuring the impact of the program on the change in practice of the physician who attends. However, Abrahamson notes that "In continuing medical education, our goals are ultimately improvement of provision of health care in the community. In order to facilitate [this] goal, continuing medical education has an intermediate objective [sic] changing the way (for the better) in which physicians practice medicine" (1).

Through the cooperative efforts of the Division of Continuing Medical Education and the Department of Urology at the University of Washington, a two-day continuing education program, "Urology for Non-Urologists," was conducted on March 7 and 8, 1968, at the University. The course objective, as stated in the descriptive brochure, was "To present current thinking on some common urological problems and to explain the reason behind present attitudes." The program format was a series of short lectures (twenty to thirty minutes each). A moderator for each half-day session made provisions for a question-and-answer period twice during each morning and each afternoon session. A total of 23 different presentations were made.

SAMPLE

The course attracted 66 physicians and 14 allied health personnel. This study presents data only on physicians. The participating physicians were represented evenly by those in group practice and those in solo practice. Sixty-nine per cent were in general practice, 9 per cent in internal medicine, 6 per cent in urology, and 16 per cent in other specialties. Seventeen participating physicians were from states other than Washington. The average age of participants was 42. A follow-up questionnaire gave the average age of non-participants as 49.

METHOD

At the end of each session, the participants were asked to rate each individual speaker, using a four-point (Likert-type) scale from "excellent" to "poor" with regard to 1) the relevance of the content, 2) the speaker's ability to communicate his information, 3) his organization of the material, 4) his visual aids, and 5) the participant's interest in the topic. The participants were asked to indicate whether they thought the material was "new" or "review" for themselves. They were also asked whether they expected, as a result of participating in this session, to initiate any changes in their practices; "Yes," "No," or "Possibly."

At the beginning of the short course, each participant was given an "information sheet" to fill out indicating why he attended. He was asked to select one of five prescribed reasons as well as to respond to an open-ended question, "In my own words, my primary reason for attending was . . . ." All participants were asked to estimate, through a four-point rating scale, the usefulness that each ascribed to current medical literature, specifically in the field of urology. Two weeks later, self-return post cards were sent to a random sample (n = 297) of those physicians who had been invited but who did not attend, requesting the information as was asked on the "information sheet" given to participating physicians concerning usefulness of current medical literature but also asking the physician's opinion about whether he had kept "updated" regarding most recent advances related to his practice and what topic(s) would prompt him to attend a short course.

Approximately nine months after the completion of the course, post cards were mailed to all physicians who had attended (n = 61), requesting them to indicate 1) whether they had, in fact, filled out rating sheets while attending; 2) whether they had an opportunity to deal with patients with urological problems; 3) whether they had, in fact, made any specific changes in practice as a result of their attendance; and 4) what specific changes, if any, they could pinpoint. Sixty-one per cent of the physicians responded, 84 per cent of whom had filled out ratings during the short course.

RESULTS

Using means as scores, degrees of relationships were computed between responses on the various topics. Ratings of relevance and interest were highly correlated (.85), whereas relevance failed to relate significantly with ability to communicate and organization of material. Ability to communicate and organization of material are also moderately correlated (.56) with interest. Thus, interest is seen as one factor which cuts across all of the other variables rated. The only other significant relationship was between ability to communicate and organization of material (.80).

The most frequent rating for 17 of the instructors was a "good" on four or more of the scales. Four instructors received modal ratings of "excellent" on three or more scales, and two instructors had scattered ratings below "good" on most scales. The average ratings did not decline with the passage of time during the day nor during successive days.

As the number of physicians indicating that the content provided ideas for improving their practices increased, the number of physicians indicating that they felt that they would make a change in practice increased over the several sessions (r = .87). No other relationships were significant.

The reasons for attending the conference are given in Table 1. The most frequent response, "Not sufficiently updated," was given by 48 per cent of the participants.

Insert Table 1 here

Of those attending the conference, 58 per cent viewed current medical literature as "of little use" as a resource for acquiring useful information in the field of urology. Nonetheless, as Table 2 shows, 33 per cent saw medical literature as "reasonably helpful" and 6 per cent viewed it as "extremely helpful."

Insert Table 2 here

Returns from non-participating physicians were received from 53 per cent of the sample. Reasons they gave for not attending the conference are presented in Table 3, the most frequent being, "Could not free myself from patient obligation," followed by, "Program lacked relevance for me."

Insert Table 3 here

Of the non-participating physicians responding, 76 per cent felt that they were "adequately updated regarding most medical research relating to my practice"; only 7 per cent felt that they were not; 17 per cent were not sure. This is in notable contrast to the replies of those who attended, of whom only 48 per cent felt that they were sufficiently updated ($p < .001$).

In four of the seven sessions, more than 50 per cent of attendees indicated that they intended to make changes as a result of material presented; for seven other sessions, over 50 per cent expected to make no changes. Percentages of change for the remaining sessions fell somewhere in the middle with responses in the category, "Possibly," accounting for the fact that neither "change" nor "no change" failed to reach the 50 per cent level.

Of those who responded, 100 per cent had dealt with patients having urological problems; of these, 76 per cent indicated that they changed practice in some manner or another and 74 per cent indicated specific changes. A summary of specific practice changes is shown in Table 4. These are grouped loosely into rough headings in order to cover the diversity of responses but, nevertheless, indicate the wide range of influence exerted by the various lectures.

Insert Table 4 here

DISCUSSION

That specific changes in practice are cited as having taken place consequent to the presentation of a short course is encouraging. Of the respondents, 74 per cent specifically indicated one or more changes in their practices which they attributed to the various lectures. This is not to say that citing changes is absolute proof of actual change, nor is it to say that short courses are the most efficient method of teaching. But the implication is that changes in physicians' practices occur as a result of information that the physicians gained during the short course.

The reaction of the attendee physicians to the short course presentations and their content was favorable for the most part. Abrahamson has stated that there is some evidence that satisfaction is related to degree of learning (1). For this sample, it was apparent that positive reaction to presentation and content is highly related to relevance of interest for the listener. This information suggests the need for experimental research with the variables of knowledge gain, satisfaction, and relevance, using improved patient care as a dependent variable.

The major reasons for not attending were whether the course had relevance and the fact that many physicians could not free themselves from their patient obligations. With 63 per cent of the physicians who responded citing these two reasons for not attending, it would be well for those planning continuing medical education courses in the future to reconsider the time when such courses are conducted, as well as to attempt to plan courses more relevant to physician needs. This information also agrees with the finding of the California study above (4).

A point of interest is the level of agreement between those physicians who indicated that they thought they would make changes in practice as a result of lectures and those physicians who actually were able to cite specific changes in practice nine months afterwards. Percentage of changes indicated for all programs was compared with the percentage of changes for all responses. This percentage included only those people who indicated that they would definitely change, and not those people who said possibly they would change. It was found that 31.6 per cent of the participants at the time of the lectures indicated "yes," that they expected to make a change in their practice. Of the returns, 74 per cent cited specific changes. Even if all of those not responding failed to make any changes in practice, the percentage of change would still be 46 per cent for the total number of participants. Thus, it would appear for this study, at least, that expressed expected change in practice was a conservative estimate of reported change in practice.

SUMMARY AND CONCLUSIONS

In order to assess the change in practice effect of a short course, 1) a study of reaction of physicians to course presentation and content, 2) a study of the reasons for non-attendance, and 3) a measurement of postcourse changes in practice were undertaken at the University of Washington School of Medicine through the Division of Continuing Medical Education and the Department of Urology. A series of short lectures (twenty to thirty minutes each) with question-and-answer periods were presented over a two-day period. Participants were asked to rate each speaker on communication, organization, and personal interest in the topic. They were asked to indicate whether, as a result of participating in a session, they would make changes in their practices. Physicians who did not attend were asked to indicate their reasons for not attending. Several months after the course, participants were queried to see if any specific changes could be cited as having taken place in their respective practices.

Results indicate that interest is highly correlated with relevance, ability to communicate, and organization. Most of the lecturers were seen as good or excellent. As programs were seen as more worthwhile, the number of physicians indicating expected changes in practice increased over the several sessions. Those who attended apparently were less sure that they were sufficiently updated than those who did not attend.

Short courses apparently provide knowledge that leads to stated changes in practice, although it is realized that the amount and the importance of the change has not been evaluated in this study. The lack of relevance of material and the physician's inability to free himself from his practice seem to be the two most important components for not attending this type of continuing medical education program.

TABLE 1

REASONS GIVEN BY PHYSICIANS FOR ATTENDING "UROLOGY FOR NON-UROLOGISTS" COURSE

N=33

Reason	Per Cent
1. Not sufficiently updated.	48%
2. Increasing number of patients with problems in this area.	13%
3. Chance to learn and get away.	15%
4. To be familiar with latest research.	15%
5. Other.	9%

TABLE 2

COURSE-ATTENDING PHYSICIANS' RATINGS OF CURRENT MEDICAL LITERATURE AS A RESOURCE FOR CULLING OUT USEFUL INFORMATION IN UROLOGY

Useful Index	Per Cent
1. Extremely helpful (most important source I use to "update" my practice).	6%
2. Reasonably helpful (I often use this source).	33%
3. Of little use to me (occasionally helpful).	58%
4. Of no use to me (an impossible task).	---
5. No comment.	3%

TABLE 3

REASONS GIVEN BY PHYSICIANS FOR NOT ATTENDING "UROLOGY FOR NON-UROLOGISTS" COURSE

N=142

Reason	Per Cent
1. Could not free myself from patient obligation.	33%
2. Program lacked relevance for me.	30%
3. Unsatisfactory previous experience with short course.	1%
4. Inconvenient location.	7%
5. Personal or family reasons.	12%
6. Too expensive.	5%
7. Other.	12%

TABLE 4

AREA OF SPECIFIC CHANGES IN PRACTICE ATTRIBUTABLE TO THIS COURSE

Area of Change	Number
Gonorrhea	8
D_x	8
R_x	8
Better therapeutic approach	3
Catheterization	3
Miscellaneous	3

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CHANGE IN ATTITUDE AS AN INDEX OF EFFECTIVENESS FOR SHORT COURSES IN CONTINUING MEDICAL EDUCATION

by

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Each year, the University of Washington School of Medicine has traditionally offered a series of two-day courses designed for the continuing education of practicing physicians. Historically, there has been little attempt to assess the outcomes of these courses. In recent years, however, both the number of programs offered and the attendance at each program have increased sharply. With the increase has come a demand for formal evaluation.

One approach to the evaluation of short courses has been to assess gain in knowledge of subject-matter content by administering pre- and post-tests. This system has four major disadvantages:

(1) It is an arduous and time-consuming task for the test constructor, the administrator, and the examinees.

(2) Emphasis is placed on finite factual material. There is ample experimental evidence that this kind of material is quickly forgotten.

(3) Emphasis is placed on product rather than process.

(4) The use of knowledge of content as the criterion implies a judgement of the speaker's performance, and the participants' competency rather than the quality of the program *per se*.

The authors believe content tests to be innappropriate for in-service courses. A great deal of research, over the years, has demonstrated the ephemeral nature of factual knowledge and the relative permanency of learning sets, i.e., study habits and skills, the attitudes towards and motivation for learning. In addition, it is obviously impractical to attempt a comprehensive treatment of a complex subject in one or two days. It follows, then, that dissemination of knowledge per se is an impractical objective for short courses such as these. Rather, we should be concerned with stimulating the search for new ideas and encouraging the full use of present knowledge. Consequently, an instrument which is sensitive to a participant's affective response to a session, a measure of his enthusiasm or motivation, should be a valid predictor of the extent to which the session will influence his professional development.

A second approach to the evaluation of in-service courses has been to ask participants to rate the sessions on a number of qualitative dimensions. Although this approach is free from the judgemental overtones of knowledge tests, the usual questionnaire does not permit the ratings to be summed over items. However, the concentration on motivation provides a rational unity which permits the questionnaire items to be treated as a unidimensional scale. Thus, the effects of errors and misinterpretations can be ameliorated by averaging over related items.

THE INSTRUMENT

The instrument described in this study was developed along the lines of Osgood's (1957) semantic differential.[1] Sets of bi-polar adjectives were constructed to assess general value (goodness) and relevance. In order to relate the judgments directly to the program, as opposed to the lecturers and organizers, two separate groups of items were developed. First, participants were asked to choose the adjectival values which best described the objectives or aims of the session as set forth in the prospectus. Second, they were asked to choose the values which best described the content presented during the session. In the content section, two kinds of relevancy were assessed: (1) the relevancy of the content to the needs of the participants, and (2) the relevancy of the content to the lecturer's stated objectives. In addition, an item assessing the familiarity or novelty of the content was included. The average of scores for items in part one was called the objective score (O), the average of item scores in part two was called the content score (C) and the overall average was called the motivation score (M). The completed motivation scale, with random rearrangement of item poles, appears in Figure 1. The marginal parenthetical comments illustrate the plan of the instrument and did not appear on the printed version. The accompanying questionnaire appears in Figure 2.

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[1] C. Osgood, G. Suci, and P. Tannenbaum, The Measurement of Meaning, Urbana, Illinois: University of Illinois Press, 1957.

(Insert Figures 1 and 2)

VALIDATION PROCEDURE

The Motivation Scale was first used at the eleventh annual meeting of the Washington Academy of General Practitioners at Olympia, Washington, in June of 1968. A useful instrument must permit statement regarding the relative merit of sessions. Consequently, the Motivation Scale was administered as a criterion variable in a simple experiment. In order to provide an estimate of concurrent validity, a questionnaire was administered which asked each participating physician to estimate the number of patients he saw each year with problems related to the topic discussed, and to check whether he expected to improve his diagnostic, treatment, patient management, or referral procedures as a result of the session. Respondents were also encouraged to make evaluative comments regarding any aspect of the program which seemed noteworthy.

Design. The experimental design involved two lecturers labeled Dr. A and Dr. B. Each lecturer gave two presentations of the same material. In one presentation, a lecture method (L) was used; in the other, questions or problems were presented so as to require an overt response from each of the participants. The latter was labeled the involved method (I). The design is summarized schematically in Figure 3.

(Insert Figure 3)

Results.

1. *Reliability.* The correlation matrix for the combined groups is reported in Table I. The obtained correlation of each of the four objective items with the total objective score (sum of items one to four) ranges from .80 to .85. The average of these correlations, calculated via Fisher's Z transform, was taken as the reliability of the objective scores (.82).

   Item number eleven (new versus old material) yeilded considerably lower correlations than any of the other content items. Since the perceived novelty of the situation was a dimension of interest, the item was retained in the total scale. However, only items six to ten were used to form the content subscale.

   The correlation of the content items (six to ten) with the content score (sum of items six to ten) ranged from .72 to .87. The average of these correlations (.80) was taken as the reliability of the content scores. The average of the correlation of items one through eleven with the total score (sum of items one to eleven) was taken as the reliability of the total score (r = .69).

2. *Validity.* It was an assumption implicit in the motivation scale that the objective and content of a session could be separately assessed. Evidence of the validity of this assumption appears in Table I.

(Insert Table I)

The objective total had an average correlation of .82 with the objective items, but an average of only .46 with the content items. Similarly, the content sub-total had an average correlation of .80 with content items, but only .47 with objective items. Both these differences were very significant ($p < .001$).

The primary evidence of the validity of the scales was provided by the correlation of each item and sub-total with "outside" indices of the relevance of a particular session to the participants. It was considered an indication that a session was relevant if a participant reported that he expected the presentation to:

(1) improve his diagnoses.
(2) modify his referral decisions.
(3) improve his treatments.
(4) improve his patient management.
(5) increase his confidence in his present practices.
(6) relate directly to problems he net in his practice.
(7) be of no benefit to his practice.

For each of the seven variables above, the correlation with each item score, the objective score, the content score, and the total score was calculated. In all variables but six, the participant simply indicated whether the expectation was present or absent. In variable six, participants were asked to indicate for an "average" year the number of patients they would expect to have problems directly related to the presentation.

A significant positive correlation was considered indicative of validity in all but the "no benefit" response, where a significant negative correlation indicated validity. It was observed that all but one of the questionnaire responses yielded significant correlations with every item on the motivation scale; the "modify referral procedures" response was significantly correlated with only five of the eleven motivation items. When questionnaire responses were summed to form a single score, the correlation with the total score on the motivation scale was .50. This was interpreted as the overall validity of the scale.

(Insert Table II)

The mean scores and standard deviations of the objective and content scales are presented in Table III. It was observed that Dr. A's ratings were considerably higher than Dr. B's on each scale for both presentations. The differences between content and objective scores for Dr. A were almost identical from presentation to presentation. The difference between objective and content scores for Dr. B, however, was significant in each presentation, and was considerably larger in the involved presentation than in the non-involved presentation. Since this agreed with the written comments of participants, it was concluded that the objectives and content were rated differentially, and that the scores reflected actual differences in quality.

(Insert Table III)

Particular importance was attached to the difference between the mean for objective items and the mean for content items, since this was an index of the extent to which the objectives were accomplished. The written comments of participants was solicited on the accompanying questionnaire (Figure 2). Comments from both Dr. A's sessions consistently used adjectives such as "interesting", "challenging", and "scholarly". No hostile comments were made. For Dr. B the comments were quite different. In the lecture session most people made no comment. Only three people called the session"interesting", two considered it "valuable", but six labelled the session as "boring", "too text-bookish", or "dull and uninspiring". In the involved session, however, literally everyone commented. Only two people called the session "interesting", one called it "challenging". The remainder were derogatory; they used comments such as "bigoted", "a hostile lecturer", and "argumentive". From the written comments, it appeared that the involved and lecturer techniques were roughly equivalent for A; B, on the other hand produced observable negative reactions with the involved technique, but only apathy with the lecture. Each of these observations was reflected in the data. It was of particular interest that the (O-C) scores for Drs. A and B were significantly different ($p < .01$). The three items directly concerned with the relationship between objectives and content are (7) content related to objective, and (8) content fulfills objective. The mean ratings for these items are reported in Table IV. It was observed that all differences were highly significant ($p < .01$). Since the differences agreed with the written comments it was concluded that the participants were _in fact_ rating the sessions in terms of the extent to which they met their stated objectives.

(Insert Table IV)

SUMMARY AND CONCLUSIONS

1. Participants of this study rated the stated objectives and the contents of the presentations differentially. There was, however, a pervasive evaluative factor: the ratings on the objective scale were affected by the quality of the presentation. This difficulty could be overcome by administering the section of the rating scale dealing with objectives _prior_ to the presentation.
2. The findings of this study indicate that the difference between means for objective and content items provides a valid assessment of the participants' perceptions of the extent to which the lecturer succeeded in meeting his own objectives.

3. The findings of this study support the validity of the Motivation Scale for comparing sessions with regard to the perceived relevance of the objectives and contents. It is expected that continued experience with the scale would provide norms which would permit meaningful statements about the overall quality of a session to be made.

Limitations

Evidence regarding the extent to which the Motivation Scale predicts actual changes in a participant's subsequent behavior was not provided. This is a necessary but time-consuming task, to which we are presently addressing ourselves. In the meantime, the scale *may* be taken as a valid measure of intent, and thus useful *per se*. In the absence of instruments which have been field-validated, it may also serve as an estimate of the effect a particular session will have on participants' subsequent behavior. It should prove particularly useful where short administration times (one or two minutes) and non-judgmental overtones are desired.

SESSION OBJECTIVE: [To be filled in by lecturer concerned]

DIRECTIONS: If you feel the objective as stated above is very important, place an "x" in the blank closest to the word important. If unimportant, place an "x" next to the word unimportant. If you feel it is only slightly important or unimportant, place an "x" in the blank just to the left or right of the center line. Place one "x" on each line.

---

1. The objective stated above is:

important	__ __ __ __	__ __ __ __	unimportant	[relevance]
valid	__ __ __ __	__ __ __ __	invalid	
bad	__ __ __ __	__ __ __ __	good	[general evaluative]
interesting	__ __ __ __	__ __ __ __	boring	

2. The content presented in this session was:

boring	__ __ __ __	__ __ __ __	interesting	[general evaluative]
important	__ __ __ __	__ __ __ __	unimportant	
unrelated to objective	__ __ __ __	__ __ __ __	suited to objective	[relevance to objectives
objective fulfilled	__ __ __ __	__ __ __ __	objective unfulfilled	
relevant	__ __ __ __	__ __ __ __	irrelevant	[relevance to participant needs
innovative	__ __ __ __	__ __ __ __	trite	
new material	__ __ __ __	__ __ __ __	familiar material	

Figure 1. The Motivation Scale.

Room I, Group I (n = 96)

2:00 - 2:30 Dr. A's lecture: no participation
2:30 - 3:00 Dr. B's lecture: participation

Room II, Group II (n = 55)

Dr. B's lecture: no participation
Dr. A's lecture: participation

Figure 3. Schematic Representation of the Design.

1. Check the area(s) in which you expect this session to be of benefit:

___ improved diagnoses
___ modify referral decisions
___ of no benefit to my practice
___ improved treatment
___ improved patient management
___ increased confidence in present practices

2. During the next year, how many patients do you expect to have with problems related to this topic?

(check one) ___ none; ___ 1-5; ___ 6-20; ___ over 20

3. The information presented is important to:

___ all MD's
___ all GP's
___ specialists (kind ___________________)
___ full-time faculty
___ nurses

4. PERSONAL DATA: Age: ___ under 35; ___ 36-45; ___ 46-55; ___ 56-65; ___ over 65

No. yrs. since grad. (MD): ___ less than 5; ___ 6-10; ___ 11-15; ___ 16-20; ___ over 20

Type of practice: ___________________ Special interest, if any: ___________________

5. COMMENTS AND / OR SUGGESTIONS:

Figure 2. Accompanying Questionnaire

TABLE I

CORRELATION OF OBJECTIVE AND CONTENT ITEMS WITH TOTAL SCORES

Item	Sum (1-4)	Sum (6-10)	Sum (1-10)	Sum (1-11)
OBJECTIVES:				
1. Objective important	.80	.44	.63	.62
2. Objective valid	.85	.47	.67	.66
3. Objective good	.80	.43	.63	.61
4. Objective interesting	.82	.53	.70	.68
Average r (1-4)	.82	.47	.66	.63
CONTENT:				
5. Content interesting	.58	.76	.78	.77
6. Content important	.50	.73	.73	.72
7. Content related to obj.	.43	.86	.79	.78
8. Content fulfills obj.	.38	.84	.76	.76
9. Content relevant	.42	.87	.80	.80
10. Content innovative	.45	.72	.69	.69
Average r (6-10)	.46	.80	.76	.76
Average r (1-10)	.60	.66	.72	.71
11. Content new material	.23	.35	.35	.46
Average r (1-11)	.57	.64	.68	.69

TABLE II

CORRELATIONS OF RELEVANCE WITH ITEM SCORES

(N = 302)

ITEM		Overall Mean Rating	RELEVANCE VARIABLES						
			Impr. Diag.	Modify Referral	Improved Treatment	Improved Pat. Man.	Increased Confidence	No. of Patients	No Benefit
OBJECTIVE:									
1.	Important	2.6	.26*	.05	.30*	.27*	.19*	.35*	-.19*
2.	Valid	2.3	.20*	.10	.24*	.19*	.22*	.35*	-.00
3.	Good	1.9	.13**	.05	.13**	.19*	.11*	.21*	-.05
4.	Interesting	2.0	.22*	.07	.27*	.28*	.28*	.35*	-.23*
CONTENT:									
5.	Interesting	1.7	.27*	.11	.25*	.40*	.33*	.33*	-.35*
6.	Important	1.7	.25*	.11	.27*	.26*	.23*	.25*	-.32*
7.	Related to obj.	1.2	.31**	.14**	.31*	.42*	.31*	.19*	-.38*
8.	Fulfills obj.	0.5	.30*	.15*	.25*	.37*	.27*	.14**	-.38**
9.	Relevant	1.5	.33*	.15*	.28*	.35*	.27*	.21*	-.40*
10.	Innovative	1.2	.15*	.13**	.25*	.24*	.21*	.28*	-.22**
11.	New material	0.8	.16*	.13*	.22*	.17*	.10	.06	-.26**
12.	Sum of obj. (1-4)	---	.24*	.08	.28*	.25*	.38*	-.14**	-.02
13.	Sum of content (5-10)	---	.34*	.17*	.33*	.43*	.34*	.29*	-.43*
14.	Total sum (1-11)	---	.36*	.16*	.36*	.42*	.34*	.35*	-.38*

* P ≤ .01 ** P ≤ .05

TABLE III

MEAN RATINGS, STANDARD DEVIATIONS, DIFFERENCES, AND t RATIOS FOR OBJECTIVE ITEMS AND CONTENT ITEMS FOR TWO INSTRUCTORS

Method	Doctor	Objective Items		Content Items		Difference	S. E.	t
		Mean	S. D.	Mean	S. D.	Obj. - Cont.	Diff.	
Involved	A	2.83	1.20	2.61	1.21	.22	.23	.95
	B	1.82	1.56	.12	1.22	1.69	.20	8.45**
	Difference (A-B)	1.01	SE =.23	2.49	SE = .21	1.47	.30	4.90**
	t	4.39**		11.85**				
Not Involved	A	2.55	1.16	2.33	1.22	.22	.17	1.29
	B	1.58	1.33	.28	1.84	1.30	.23	5.65**
	Difference (A-B)	.97	SE =.21	2.05	SE = .28	1.08	.29	3.72**
	t	4.62**		7.32**				

** $P \leq .01$

TABLE IV

MEAN RATINGS, DIFFERENCES, AND t RATIOS FOR ITEMS SEVEN AND EIGHT FOR TWO INSTRUCTORS

Method	Doctor	Item Seven		Item Eight		Seven and Eight	
		Mean	S. D.	Mean	S. D.	Mean	S. D.
Involved	A	2.25	1.90	2.65	1.55	2.45	1.50
	B	- .26	2.33	- 1.48	2.08	- .87	1.95
	Difference	2.51	SE =.35	4.13	SE =.30	3.32	SE =.28
	t	7.2 **		13.8 **		11.8 **	
Non-Involved	A	2.42	1.57	2.13	1.67	2.27	1.45
	B	.38	2.37	- .82	2.21	- .21	2.03
	Difference	2.04	SE =.36	2.95	SE =.34	2.48	SE =.31
	t	5.7 **		8.7 **		8.0 **	

$*P \leq .05$ $**P \leq .01$

The Consultant's Letter

Progress Report

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Letters to referring physicians, written by consultants on the staff of the University Hospital, Seattle, were studied for usefulness of the information transmitted. Scientific content is considered adequate but the letters lacked concern for the patient as an individual in his own environment. The authors deplore the fact that this opportunity for teaching is seldom grasped by the consultants.

As stressed two years ago by one of us, the potential value of the consultant's report as a means of fostering continuing medical education has been neither fully appreciated nor explointed.[1] To further substantiate this claim and estimate the utility gap, we undertook the following analysis.

method

We obtained copies of 106 consecutive consultants' letters, typed over a two-day period by the secretarial pool at the University Hospital, Seattle. Twenty were discarded because they were either written to non-professional recipients or simply reproduced form letters intended to accompany hospital discharge summaries. (No discharge summaries *per se* were included.) The remaining 86 letters to referring physicians were read and qualitatively scored according to the following criteria:

1. *Technical Content.* Did the report summarize the patient's presenting problem and describe in general terms what was done? Was a differential or precise diagnosis included? Was a therapeutic plan outlined? Were specifics of follow-up included?

2. *Holistic Concern.* Did the consultant indicate *in any way* an acquaintance with, or concern for, the "total patient"—i.e., was the evaluation and treatment tailored for the patient in his own environment rather than just for his disease?

3. *Style and Tone.* Did the format of the letter orient the reader rapidly and was its tone positive and direct? Was proof reading adequate?

4. *Educational Specifics.* Did

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TABLE I
Informational Content of 86 Consultant Reports

Content Category	*Percent Present*
A. Reiteration of patient problem	70
B. Description of clinic or hospital activities	88
C. Definitive diagnosis	
1. Specific diagnosis	67
2. Working impression	94
D. Therapeutic plan	91
E. Follow-up specifics	81

the consultant make any perceptible effort to contribute to the continuing learning of the referring physician? Were any references included?

results

As noted in Table 1, the technical content—in five specific categories—was remarkably complete. And when a letter was faulted, generally only one of the points was omitted. Approximately one in four letters omitted a single bit of information judged by us to be critical, either for complete comprehension or total management of the patient's problem. These were items such as drug dosage, return visits, or equally pertinent matters. Direct or implied statements reflecting the consultant's aquaintance with, or concern for, the whole patient were detectable in only 30 percent of the reports; 70 percent made no reference whatsoever to this item. Somewhat in contrast, in 88 percent of the letters the style and tone were judged as "direct, positive, and lucid." Eighty-six percent had no major typographical, transcriptional, or dictational errors.

Only 30 percent of the reports presented evidence that the consultant had seized the opportunity either to convey to the referring physician relevant new information or to reiterate, reinforce, reevaluate or reorganize existent information. Furthermore, *in not a single instance was a reference to either a textbook or journal article included!*

discussion

To a large extent, this analysis of information content corroborates referring physicians' perceptions of such content, as reported in 1966.[2] In both instances the letters were seen as being considerably more complete than in the study by de Alarcon, et al, and their review of this topic in Britain.[2] (Conceivably this disparity in completeness is simply a reflection of the use of the dictaphone and typewriter in the United States as opposed to the quill in "merry olde Englande.") Moreover, the "lackadaisical attitute" detected by Chamberlin[3] was nowhere detected in the letters studied.

A specific and relevant omission was uncovered in one of every four reports. For emphasis, this is a qualitative assessment, obviously dependent upon a judgment factor in the evaluators. If we erred, it was because the study was purposefully directed at overestimates of completeness. Conceivably, still more data need be included in consultants' letters. Possibly providing a printed check sheet of critical components of such reports to the dictating physician at the time same time he proofreads and signs his letter would help avoid omissions. This alternative is to be explored.

That acquaintance with, or concern for, the total patient was demonstrated in less than one third of the reports is perhaps simply a reflection of the specialized role played by the consultant. Indeed it might well be argued that such is the appropriate role for the technical specialist with the integrative function to be performed by the referring generalist. Always the question must be asked, however, "Can definitive treatment plans actually be developed without being tempered by considerations of this sort?"

Finally, the major purpose of this analysis was to appraise the consultant's report for its continuing education potential and utility. Frankly, the results here were disappointing; the device at hand is not being used. No data are presently available documenting either the referring physician's thoughts in this matter or the effectiveness of such efforts, assuming they are seen as important and assuming they are undertaken. But, as noted in the 1966 report, and as supported in learning theory, the potential of such letters should be significant, dealing as they do with highly relevant situations, in overcoming the physician's "new-information barrier" or in motivating immediate behavior change. Capitalizing on this potential, either by calling attention to, or providing avenues for, further exploration of relevant points, obviously has not been done in this sample. To initiate such efforts we should like to propose that a *specific, relevant,* and *easily obtainable* reference be appended to every such letter or report in the future. The implementation of the Regional Medical Library obviates difficulty with this last requirement. Not only would such reference permit the reader an avenue for follow-up—should he choose to explore it (and a 10 percent exploration rate could be considered successful)—but also the reference by its very presence, would remind both writer and reader of the educational potentials of this particular vehicle. If references are not available at the consultant's fingertips, or in his card file, he can easily cull them from "Current Medical References"[4] or the appropriate "Yearbook,"[5] thus promoting his own continuing learning.

summary

Following up a previous study of the consultant's report and how it is viewed by the receiver, we have analyzed the informational content of a sample of 86 such reports—particularly to determine their continuing education ingredients. While the contents were judged as relatively complete in terms of their primary purpose (one in four still had significant omissions), less than 30 percent conveyed any glimmer of continuing educational light. Appending but a single reference to each such letter would not only service the reader but would also focus the writer's attention on the continuing medical educational potential of this medium. ■

University of Washington
School of Medicine (98105)

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Closing the Information Gap

Last June saw Rh immune globulin—*RhoGAM*—become available for general use. Administered to the previously unsensitized Rh negative mother within the first 48-72 hours after her delivery of an Rh positive offspring, or following an abortion or miscarriage, RhoGAM is aimed at preventing her sensitization and circumventing Rh problems with a subsequent pregnancy. The responsible mechanism apparently involves the immune globulin's affinity for any Rh positive fetal cells which may have escaped into the maternal circulation at the time of delivery and which, left to themselves, would prime her for immunity trouble. The globulin-red cell combination seems somehow to eliminate the antigenic potential of the fetal red cell. Thus, a simple injection has the potential to virtually eradicate hemolytic disease of the newborn due to Rh incompatibility and to push its ultimate effect (a permanently damaged infant) and its current treatment (exchange transfusion) far down the road toward extinction.

In many ways this very model of a modern major disease offers a textbook picture of the interplay of heredity and environment as seen at the molecular level (antigen-antibody, bilirubin), the cellular level (RBC's and lymphocytes), the organ level (uterus, placenta and liver), and the total body-mind combination (child's IQ and behavior and parents' psyche). Can this complexity help explain why the disease, first described in the mule in 1774—but not recognized in the human till 1791—had its genetic mechanism reported in 1942—again in the mule—but not in man until 1939.[1] Can it possibly explain why Levine's 1943 observation regarding ABO incompatibility protection[2] was really not exploited for almost two decades and then by a butterfly geneticist who alleges it was his wife waking him in the middle of the night who gave him the idea of treatment simply by using anti-Rh serum?[3] Is this all simply due to chance? The "p" value borders on zero. Rather it exemplifies the combination of the right facts in the right mind at the right time—or the "ah ha" phenomenon!

Real therapeutic breakthroughs—despite subtle hints or press conferences to the contrary—are, in fact, relatively unusual. Perhaps *damn rare* would be a better term. Even rarer is a therapeutic maneuver whose success rate borders on 99 percent. And almost unique is the fact that availability of Rh immune globulin occurred almost simultaneously throughout the country when government regulations permitted its release. The time was right to take advantage of this combination of events—for an entirely different purpose. The question: "Did three months suffice for knowledge of this breakthrough to diffuse out to the practicing physician? If so, how did it get there? And more importantly, did it induce any change in his behavior?

Through the cooperation of both the King County Central Blood Bank and the Snohomish County Blood Bank Association we were provided with a list of physicians who had delivered Rh negative patients (potential recipients of Rh immune globulin) during the three months immediately following its release. The King County Central Blood Bank had directed a letter of announcement to every physician in the county just prior to the product's release. Its Director, Dennis M. Donohue, and its Head of Immunogenetics, Eloise R. Giblett, had also directed a letter to this Journal[4] as well as to the Bulletin of the King County Medical Society. Dr. Giblett had further reinforced these efforts with a personal telephone call to the physician of every patient with a prenatal Rh negative blood typing. The Snohomish Blood Bank and its Director, Clayton R. Haberman, had pursued an analogous course of action in spreading the word—particularly by way of hospital staff meetings. (In Spokane County yet another reinforcement was provided via an educational program for delivery room and obstetrical nurses in hospitals.) When these efforts were added to those of the bulk of professional journals, medical magazines, *Time*, *Newsweek* and *Life*, and the many sessions of professional groups, the word was bound to get around. The theoretical potential of Rh immune globulin and the progress of field trials have been reported over the last four years.[5] The American developer of the immune globulin, Ortho Pharmaceutical, prepared a detailed dis-play at the spring obstetrical-gynecological meetings in Chicago and followed with an informative pamphlet to all obstetricians and generalists delivering babies at the time of RhoGAM's release. But, did the message get through? And if so, how?

In the King County Blood Bank sample, 162 potential recipients of Rh immune globulin were identified during this interval. Of these, 110 had received it. For an additional 33 it was not administered for reasons considered valid. However, 19 failed to receive Rh immune globulin. At the moment, there is no reason detectable in the Blood Bank records for these 19. In several instances patient refusal is known to have occurred because of cost. The recent, still further reduction in cost ought to eliminate refusal. Regardless, at least 88 *percent* of those women at risk had received the indicated treatment and within the first three months of the introduction of the technique. This raises the question, Where is the "application gap" to which so many allude?

Remembering our focus was primarily on the use, we selected a stratified sample of 24 physicians—14 obstetricians and 10 general practitioners—from the listings. One of us (HF) then telephoned each, and after an explanatory introduction posed questions about each of the three points noted below. Uniformly, he was accorded full cooperation by each of the practitioners. In response to the question, Can you recall where you first came in contact with information about RhoGAM?, 12 of the 14 obstetricians responded via medical journal reading; only 3 of the 10 general practitioners pointed to journals with 7 citing verbal encounters either with colleagues, consultants or detail men. This supports Menzel's conclusions about the contrasting mechanisms for the diffusion of medical information into the practicing community.[6] When asked the question, What convinced you to use RhoGAM?, again the obstetricians pointed largely to the written word, the general practitioners to verbal confrontations.

During the telephone conversation several indirect questions were posed aimed at detecting the physician's comprehension of the physiologic mechanisms involved, i.e., Do you plan to use RhoGAM for all your Rh negative pregnant patients? Why—or why not? Twenty-two of the 24 respondents were remarkably precise in their answers and, we inferred, accurate in their comprehension and application of the science-knowledge involved. Apparently the concepts involved, while new and different for the practitioners—although they had been postulated in 1909[7]—were absorbed with remarkably little effort.

Obviously then, the appropriate knowledge had diffused out to the medical community and had brought about appropriate behavior change. Somehow continuing education had taken place and its goal of improved patient care had been realized. Possibly the saturation approach of wide spread factual dissemination or emotional appeal is the only successful one. If so, it presages an impossible situation for the future—in considering the impact of the so-called "knowledge explosion" also known as "publication inflation." Today, there is far too much to read, far too many meetings to attend, far too many TV broadcasts to watch or radio programs to listen to. Each relevant advance—many admittedly not 99.9 percent effective—cannot be expected to bring about physician behavior change simply by random diffusion or Brownian movement.

Consider this as a possible reason for participating in attempts to analyze objectively a multitude of your continuing education efforts—to see if you couldn't do it better. *Insist* on the chance to express your opinion on these matters, and in such a fashion that you won't be ignored. Demand evidence of effectiveness of the educational efforts. You have already proven that you work; now the burden of proof is with the educational effort.

Haigh P. Fox, B.A.
William O. Robertson, M.D.

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EDITORIAL

Sock It To Us

Even the most skeptical of skeptics agrees that in order to stay abreast of progress, the modern physician must constantly update himself—and at an ever increasing pace. While a few may not sense the need, all evidence—journal subscriptions, conferences held, courses attended, etc.—confirms that most are, in fact, attempting to do so. Conceivably, we're not always successful—but some recent studies suggest we may be far more so than suspected. Consultations, local staff conferences, and medical journals make up the backbone of the method. My guess is they will continue to do so. But modern communication methods and transportation systems expand the possibilities of tailoring teaching efforts to individual learning needs.

Admittedly, each of us differs as to which methods of learning appeal most—or which one works best. Some of us are verbalists (or is it "verbalizers"); others, readers. Some of us are "seers"; others are "listeners." Some learn best from doing; some perhaps from observing. The point is that for none of us is one technique of learning in and of itself either applicable or sufficient to produce maximum results; in fact, a given method may be most efficient for some but least efficient for others. Hence we play the field—and the field is changing!

Perceiving this variation among their customers, primary schools, high schools, colleges, and universities are offering a buffet, a smorgasbord, a supermarket-approach via modern technology. Books, lectures, films, audio-tapes, TV, etc.—and various permutations and combinations thereof—the works are made available. One eventual aim is to have the learner himself take responsibility for picking and choosing the most appropriate modality for him.

Recognizing both the increase in desirable information (despite an obvious "publication inflation" there is still an "information explosion") and the advantages of letting the learner pick and choose which method works best for him, five recent developments in the Pacific Northwest warrant attention.

1. Several years ago a pilot medical television series originated in Portland; while evaluation of these initial efforts proved somewhat disappointing, it's upwards and onwards. After much local and regional planning and local production, open channel medical educational TV has now also premiered in Washington. The first pilot offering produced under the aegis of the Washington/Alaska Regional Medical Program and featuring Virginia Mason Clinic's Dave Fryer and John Tytus—"Bedside Diagnosis of Stroke"—has now gone out over the airwaves. Other programs are due to follow. Meanwhile, at the local hospital level, the Network for Continuing Medical Education (NCME) has installed video tape machines for local viewing of any available TV tape. In other words, television is on the scene—and more is to come.

2. In conjunction with the already five-year-old California "University Medical Network," ("Medical Radio Conferences," Tuesday, 12:30) FM radio broadcasts, which allow simultaneous telephone input from any point in California, Oregon, Washington, or parts of Idaho and Nevada, now reach all of these states. More than 22 stations are involved. Modern technology thus permits to and fro dialogue and all of its advantages. Hence, in the taxonomy of learning, this system overcomes the limitation of simple information dispersal.

3. Also, using techniques developed elsewhere, the physicians of southeast Alaska—geographically so isolated one from another—are now joining together via the telephone-conference-call-system. Under this arrangement, these physicians located at distant points are now able to join in discussions among themselves or originating anywhere from the "lower 48."

4. As noted already in these pages (NORTHWEST MEDICINE, August 1968) a Pacific Northwest Regional Health Sciences Library is now being implemented making access to all recorded medical information available to any physician. The concept alone is enormous.

5. Finally, recognizing the extent of future possibilities, practicing physicians, community

hospitals, medical schools, regional medical programs, state agencies, and voluntary agencies, etc., are working together to capitalize on this technology. For example, in the September-October 1968 issue of Oregon Medical Association's *Continuing Medical Education News*, Spence Meighan reports on the success of a conference of continuing education-nicks from Oregon, Idaho, Washington and British Columbia. Washington has just witnessed the creation of a forum—a Continuing Medical Education Council—developed by WSMA, the Washington Medical Education and Research Foundation, the Washington/Alaska Regional Medical Program and the School of Medicine—to zero in on the issues—and how to exploit technology. Logic demands that we must work together and elicit local involvement—and, for maximum efficiency, develop not simply a medical but health sciences-wide continuing education network.

Lest this seem so much fluff— [illegible] is not! In Britain, for example, a scant ten years ago saw less than 5 percent of physicians attend any formal continuing education course; last year, more than 56 percent did so. Already the Oregon Medical Association has established, as a requirement for continued membership, evidence of updating efforts on the part of its members. Martin Cummings, Director of the National Library of Medicine, is talking of a national biomedical network, an integral component of which is a satellite-directed, color, medical television channel available to each and every physician over the entire continent. People are thinking big—they have to.

The point then is not whether technology is here to stay; it is. Technocrats abound and will be multiplying like rabbits. The issue is which controls what—and how soon. Who will be master; who, slave? Familiarity with the technology may decide the outcome. Thus, a plea for each of you to whet your appetite by wetting your feet. Expand your horizons; try tape recorders, watch medical television, listen to medical radio, participate in telephone conferences—and read. Learn about the alternatives. Form opinions, and then after having done so, continue to cooperate with evaluation efforts. Threatening or non-threatening—the questionnaires aim at the medium, not at you personally. These can help us as individuals as well as groups. Decide not simply which medium is most popular, but which one works best—and for how much.

Who knows but the year 2000 may see a "personalized maximal learning profile" developed for each medical student—and carried forth with him as he ventures into practice. It's our job to set the stage for the best of the "Brave New World." ◘

W.O.R.

Basic Science Problems

The year just past was a year of questions, almost as much as it was a year of events. Few institutions and few ideas have escaped scrutiny. And the way the questions are answered will have an effect for a long time to come. The idea of a state demanding that practitioners of the healing arts have some knowledge of basic sciences has been no exception. Usefulness of the basic science examination has come under serious question and the answers will have their influence on the quality of care provided for citizens for a long time to come.

The basic science examination was not developed as a device to estimate proficiency in practice. It was designed to do the only thing a professional licensing law can do—establish a minimum standard. It is a screen through which the qualified can pass, regardless of the degree of their proficiency, but through which the un-

PUBLISH, PERISH--OR POOP OUT

Piqued by curiosity, I recently updated a study begun some ten years ago. The object: to look at our pediatric journals, to see what they are saying, who is saying it, how long they take to say it, etc. The subject: *Pediatrics*, *The Journal of Pediatrics*, and *The American Journal of Diseases of Children*; (at inception, Clinical Pediatrics was not yet on the scene). The method: Simply set up criteria, count and record data by specific journal; then compute averages, percentages, and so on. The years covered: '58, '59, and '60 versus '67 and '68. Nothing too fancy--save for application to the recent set of Feinstein's memorable categorization on "Non-human-non-disease" papers--one other way of grappling with the issue of relevance of journal content to problems of practice.

Each of these three journals provides nearly 1,000 pages of textual material every six months. Figuring 700 to 1,000 words per page, the average reader proceeding at 300 words per minute for reading--not necessarily for "studying" or "understanding"--would take approximately 160 hours every six months or about six hours a week to consume their respective contents. Even then, he would have missed almost 65 per cent of the pediatric articles abstracted by the Yearbook of Pediatrics--and purported to be important. And, were he to add them, he would encompass only articles immediately related to the field. Obviously, the "crunch" is here, the squeeze is on--and it has been for a long time. Some available options: read faster, become more selective, or throw in the sponge. Not particularly attractive alternatives; only the second can be considered acceptable and even that holds reservations.

Rest assured, however, that authors have yet to throw in the sponge! As de Solla Price confirms, the information explosion as he calls it--or is it simply a "publication inflation"--continues so that output of papers and journals doubles about every 15 years.(1) While the rate remains relatively constant--and has for more than two centuries!--the absolute numbers of papers continues to burgeon geometrically. And, so do the number of authors. Of the more than 1,500 pediatric articles published in the initial interval, some 30 per cent had a single author; only 15 per cent "required" four or more. Over the ensuing decade, a change has occurred; now only 25 per cent of these pediatric papers are sired by an individual; multiple authorship--four or more--accounts for 21 per cent; and over the past five years in our Pediatrics Department at the University of Washington, multiple authorship accounts for 24 per cent of all papers produced. One wonders why.

Considerably more dramatic--and conjuring up all kinds of additional speculation--is the fact whereas '58-'59-'60 saw some 74 per cent of articles spawned in the medical schools, '67-'68 saw more than 87 per cent originate there. And of the 13 per cent that did not, a significant proportion stemmed from the armed services--and the NIH! By these criteria, practicing pediatricians are the "silent majority."

Conclusion: Has the time-squeeze for reading lead to a retreat from writing? Possibly, but I doubt it. More plausible possibilities are obvious. Is it that the two worlds of medicine--academia and practice--like Snow's two cultures, are simply moving further apart.(2) Practicing physicians apparently are not recording their observations or, if they are, they are having their efforts at writing rejected by Editorial Boards--a seemingly unlikely occurrence. Could it be that virtually every pediatrician and his brother is able to secure a faculty appointment so that the "University without walls" is in reality a fact of life? Were this option correct, it would portend real excitement for the future. Should it be another, i.e., that of "separatism," however, it could spell doom--and not simply for pediatricians and the profession, but also their patients. Careful observation, critical analysis, and concise, clear recording of clinical experiences, is a sine qua non of the practitioner who proposes to continue in the forefront of medicine. Although "publish or perish" may be the scoffed-at motto of academe, it is extremely relevant to his frame of mind. And, it is perhaps even a more relevant concept for the practitioner unless he is to "poop out."

The process itself, as Woodford has emphasized, can be a revitalizing experience when such are clearly needed by all of us.(3) Thus, a plea to practitioners for prophylaxis in practice; prepare a paper for publication--promptly!

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The Bulletin of King County Medical Society Vol. XLVII No.5

University

Research in Continuing Medical Education

Bull Med Lib Assn Spring '68

Do you feel that with all that's going on in the world, you're getting further and further behind the professional times? Evidently we all do, though we may wonder whether it really makes a difference or just how much. Take heart. Price reminds us that our professional forebearers objected to the same types of pressure; for 200 years they also felt the crunch of being somewhat less than up to date.

In a humorous vein, Kelly West utterly demolishes professional confidence in the value of existing knowledge with the following bit of specious reasoning. Of applicable medical knowledge that will be available in 1980, only half is actually known today. Of that half, at best, 20 per cent is taught in medical school. Of that, a small part is in error leaving 19 per cent of which, at most 16 per cent is learned, of which conceivably 8 per cent may be retained. Specialization reduces still further that which is able to be used by the individual and some knowledge becomes obsolete. Thus, only about one per cent of the factual information today's medical student will be using in 1980 will have been learned in medical school. The rest must be gleaned elsewhere!

While all of us, including West himself, might doubt the precision of his percentages, none would question the implication that continued learning is imperative. To encourage such is the primary mission of Jack Lein's Division of Continuing Education at the School of Medicine—and comparable units of various professional organizations and hospital staffs throughout the state. At the moment, however, unfortunately all too little is known about how doctors continue to learn, what they need to learn, what teaching techniques are both effective and efficient, what information is relevant, and what should be retrievable.

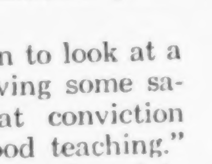
To help look into these questions, an Office of Research in Medical Education has recently been activated at the School of Medicine. Under the direction of Charles W. Dohner, Ph.D., whose background and training are in the fields of education and whose faculty appointment is in the College of Education, one of the first efforts will be directed towards continuing medical education.

Springing up in the post-World War II period at the University of Buffalo, a group of semidissident medical faculty members joined with their College of Education to look at what they were doing in teaching to see if there might be a better way. Today, disciples from the original group are spread throughout the country playing a large part in the push which has undergraduate curricula in a perpetual state of revision at virtually every medical school the nation over. Championed by George Miller, now at Illinois, "research-in-medical-educationists" are attempting to bring some elements of the scientific method to analysis of medical education. At the undergraduate level, change has been phenomenal; in graduate training, fewer changes have occurred; in continuing education, much remains to be done.

Obviously, the same educational principles hold for all three groups. Thus the active participation by learners themselves in their educational efforts is essential for optimal learning. For example, in the end it is only the learner who can opine whether a given bit of information is relevant, whether a given attitudinal change may be desirable or whether a specific manual skill might prove helpful. And, once goals or objectives are specified, the success of an educational program can only be measured in terms of the learner's behavior—or the effects of his behavior or his patients — unless one remains naively satisfied at equating "effort" variables with success instead of "effect" variables. It is for these reasons that this Office of Research in Medical Education will be dependent upon the help of learners as individuals and as groups, for without their cooperation improvement of the educational process will fail.

We have already begun to look at a few of the issues—removing some sacred shrouds from what conviction alone had set up as "good teaching." For example, we are collecting data from throughout the medical world about the successes and failures of various continuing education efforts. Why is it that less than 5 per cent of the New York area physicians ever look at their free medical TV? Presently, we're also working with the Washington State Medical Education and Research Foundation in gaining opinions from practicing physicians about their own perceptions of needs. The Regional Medical Program is feeding in data about apparent "knowledge gaps" or the application of "knowledge bridges" in the areas of heart, cancer and stroke. We have had discussions with Herb Hartley and have begun to explore how physicians

(Continued on the next page)



William O. Robertson, M.D.
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School of Medicine
University of Washington

Research in Education

(Continued from page 163)

use or would like to use medical journals. Preliminary findings certainly suggest the bona fide "Journal of Irreproducible Results" ought to be jointed immediately by a "Journal of Incomplete Results" and a "Journal of Premature Results"—each calling clearly to the attention of the reader the address of the "Journal of Quiet Retractions."

Over the next few months we hope to be contacting various individuals and groups of physicians to begin to work out ways of determining how physicians use these tools of continuing education. Together we will try improvising new approaches—and measuring success or failure.

As never before, because of the social and political pressures as well as the knowledge explosion, the practising physician has a big stake in this enterprise. How can he mold the new technologies to his needs, rather than have himself simply molded to them? Brainstorming, masscomm, ardent convictions and enthusiasm *per se* will not suffice in developing answers. Only through the active collaboration of practicing physicians can data be developed and distilled to devise optimal alternatives so that "lifetime learning for physicians" can become a reality. We believe this Office of Research in Medical Education will be most helpful in achieving the goal.

Award to U. W. Staff Member

Lederle Laboratories has announced the selection of Dr. Paul Bornstein of the University of Washington School of Medicine as recipient of a Lederle Medical Faculty Award.

The award, developed to assist young men aspiring to careers in medical teaching and research, pays part of Dr. Bornstein's salary for three years and includes $1,500 to be spent at the awardee's discretion toward furthering his academic career.

Dr. Bornstein, assistant professor of medicine, joined the medical faculty in 1967 after five years as research investigator with the National Institutes of Health in Bethesda, Maryland.

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APPENDIX G

UNIVERSITY OF WASHINGTON
School of Medicine
Seattle, Washington

INTERNSHIP RATINGS AND CONSEQUENCES FOR STUDENT MATCHING

by

Ronald L. Hamberg, B.A.
Research Assistant, Office of Research in Medical Education

Charles W. Dohner, Ph.D.
Director, Office of Research in Medical Education

William O. Robertson, M.D.
Associate Dean
School of Medicine

Little is known about why students choose to apply to particular internships. Less is known about how faculty counselors advise them or the basis of their advice. Although approximately 70 per cent of our students are matched by the National Intern and Resident Matching Program with their first choice of internship site, some 30 per cent must settle for a second, third or lower choice. And a few are not matched. Were predictors of success or failure available, they might provide guidance in selecting "appropriate" choices.

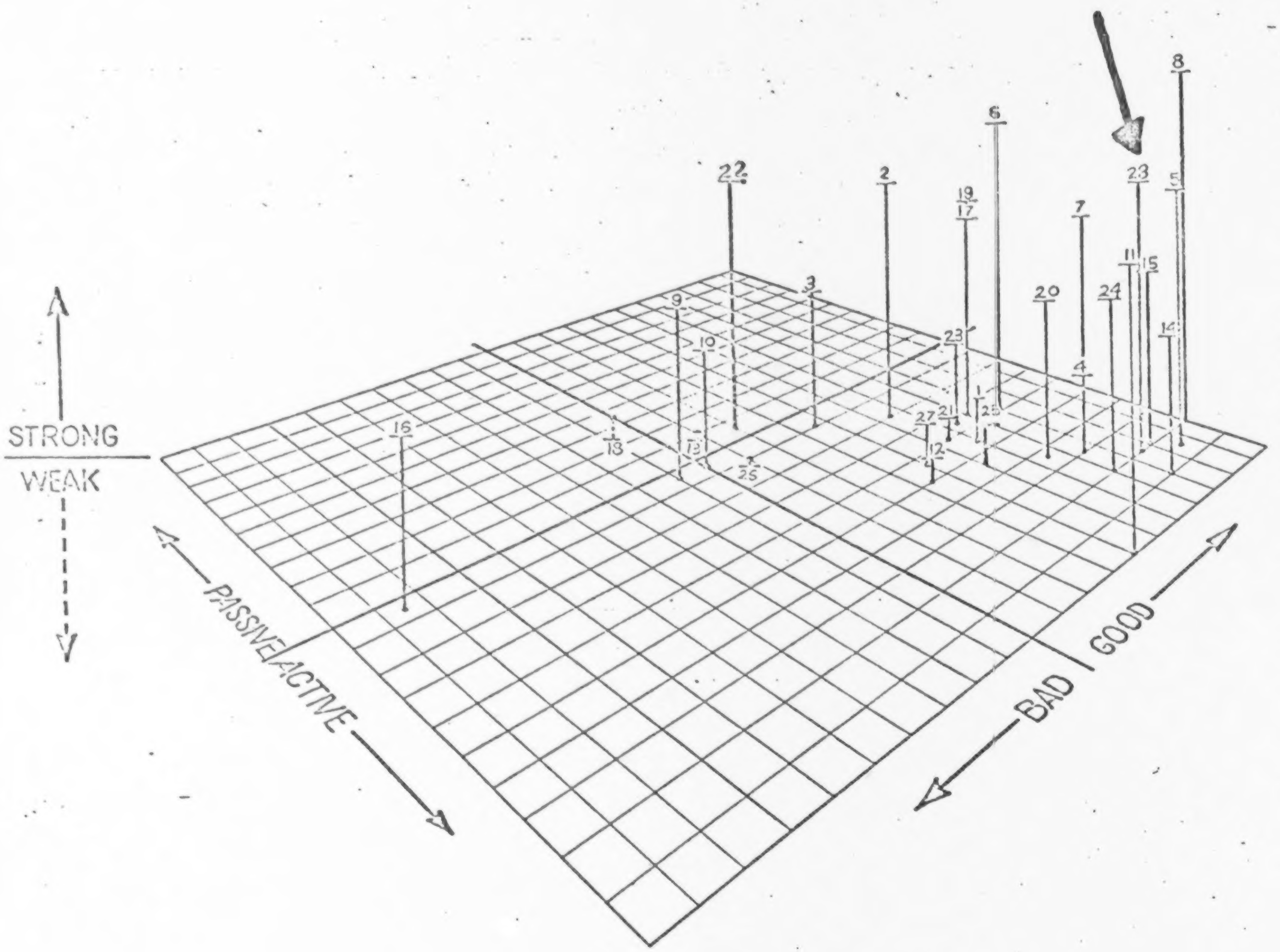
A group of ten faculty internship advisors were identified; five were internists; five, other specialties. Each then rated independently into five categories all of the internships (site and type) achieved by our 1967 and 1968 graduates, using a modified Q-sort technique. Interjudge reliability was .95, implying significant concurrence among this group. No intra-specialty mean difference was found. (As of yet, the basis of this concurrence remains obscure; nonetheless, it seems pervasive among this group.)

The following data were then assembled for the classes of 1967 and 1968: undergraduate grade point average; MCAT scores; second-year, fourth-year, and over-all class rankings; National Board scores; first, second, and third choices of internships; and sites matched. Next, using the average ratings of the internships as the dependent variable, we performed a stepwise regression analysis. Results indicate that over-all class rank shares the most variance (.21) with the internship achieved. Adding the seven other variables raised the variance to

.27--an increment not considered "significant." Perhaps more important is the finding that use of this predictor demarcated 58 per cent of the students who failed to match with their first choice, where failure to match was defined as being above or below 1 SEest. The majority of these students are from the upper third of the class who aimed "too high"; none of the students shot "too low." The results are being cross-validated with data from the class of 1969.

In addition to the potential help this information may provide for advising students, we are interested in investigating the basis of the agreement found among our raters. And does this agreement exist among advisors at other schools and, if so, how?

APPENDIX H



Key

1. Audio-visual aids
2. Lectures
3. Laboratories
4. Clerkships
5. Curricular change
6. Medical research
7. Medical teaching
8. M.D. degree
9. Exams for grading purposes
10. Grades
11. Competition
12. Instructional quizzes
13. Student organizations
14. Fellow medical students
15. Patient care
16. Illness
17. Community service
18. Sick people
19. Theoretical learning
20. Practical training
21. People
22. Administration
23. Student-faculty relations
24. Fulltime faculty
25. Part-time faculty
26. Graduate teaching assistants
27. Teaching residents
28. Personal responsibility for continual learning

Fig. 1--Semantic Differential Depiction for Freshmen.
(Numbers at right correspond to semantic locations.)

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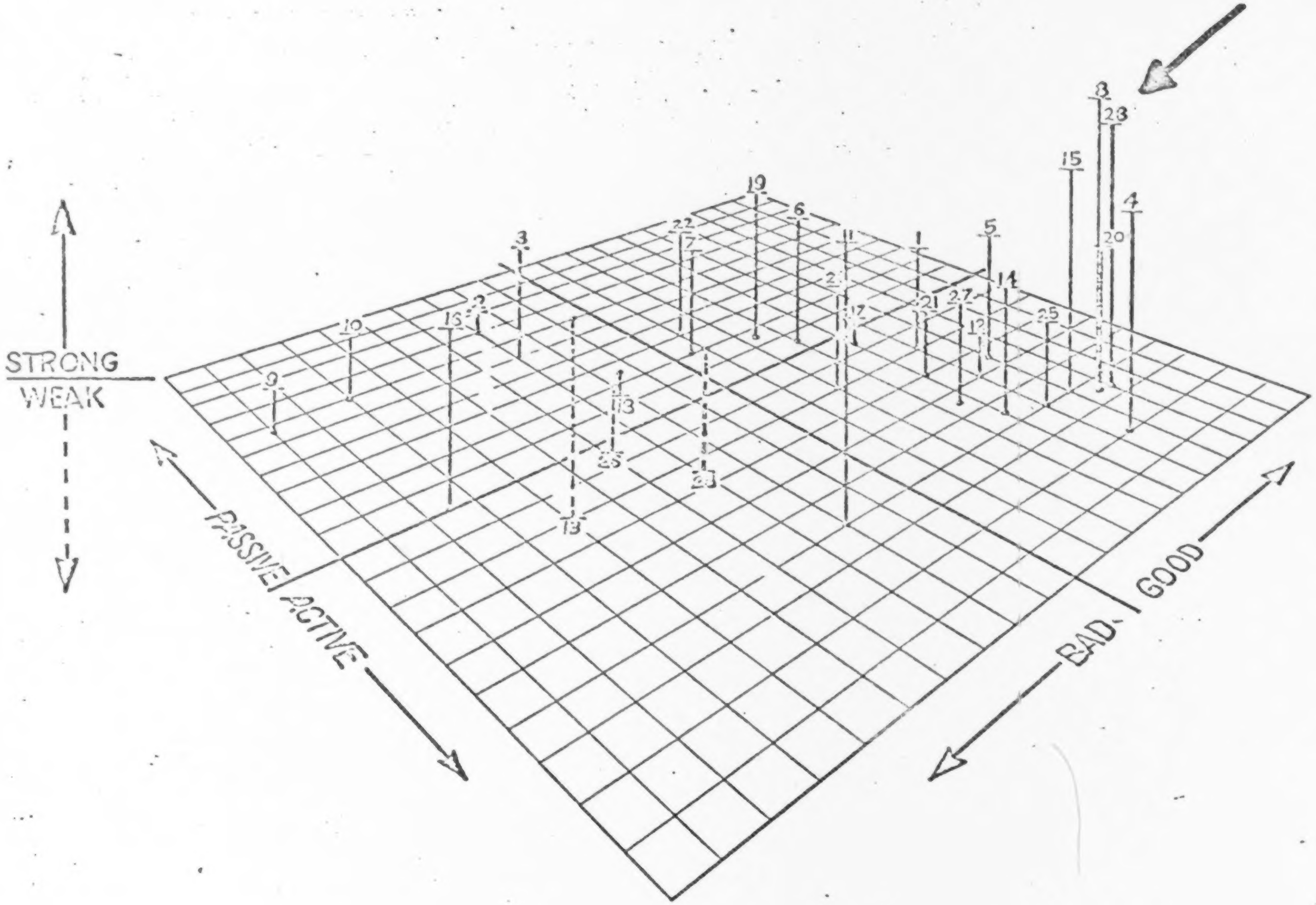

Fig. 2--Semantic Differential Depiction for Juniors.
(Numbers at right correspond to semantic locations.)

Key

1. Audio-visual aids
2. Lectures
3. Laboratories
4. Clerkships
5. Curricular change
6. Medical research
7. Medical teaching
8. M.D. degree
9. Exams for grading purposes
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28. Personal responsibility for continual learning

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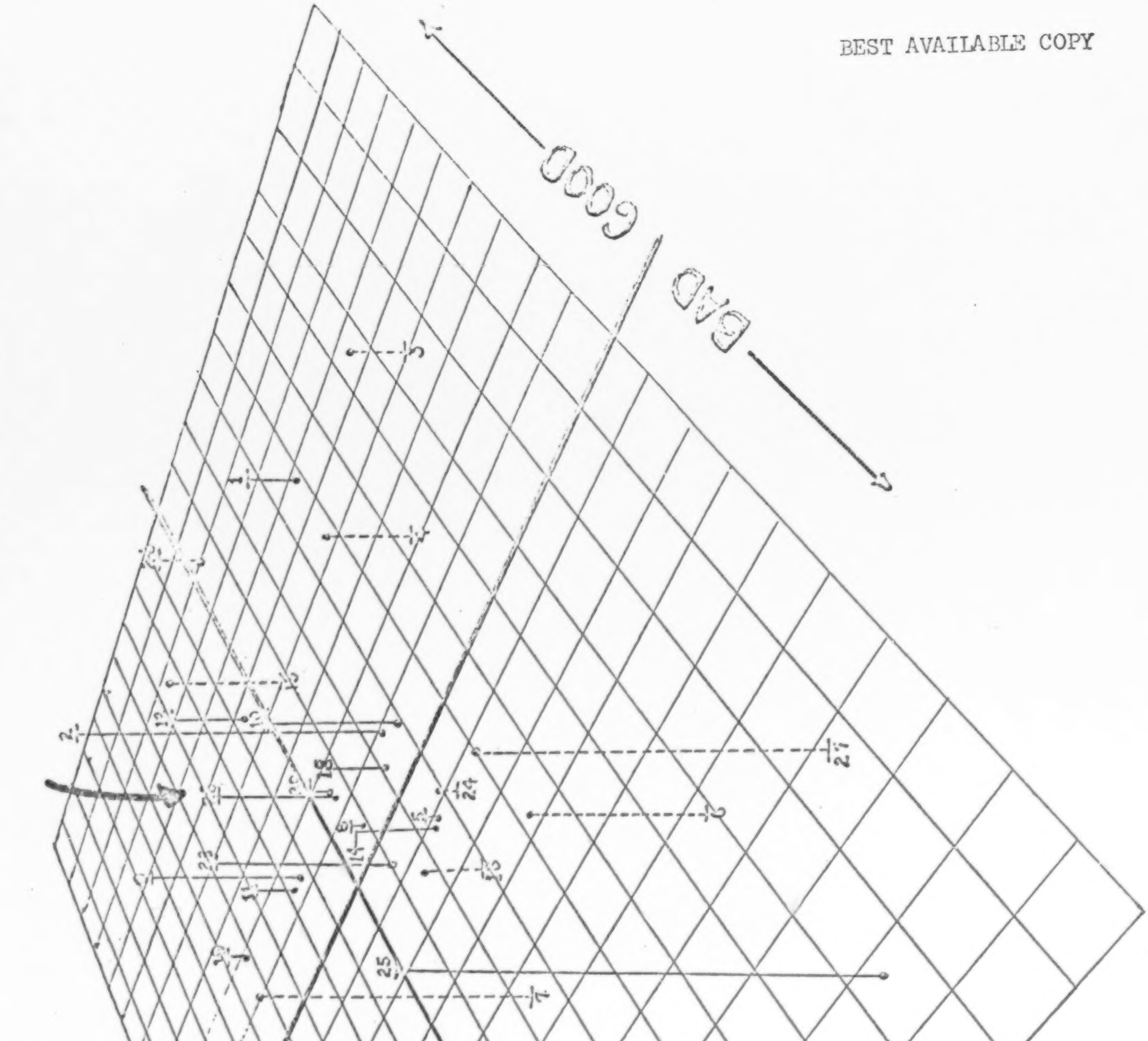
GOOD
BAD
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17
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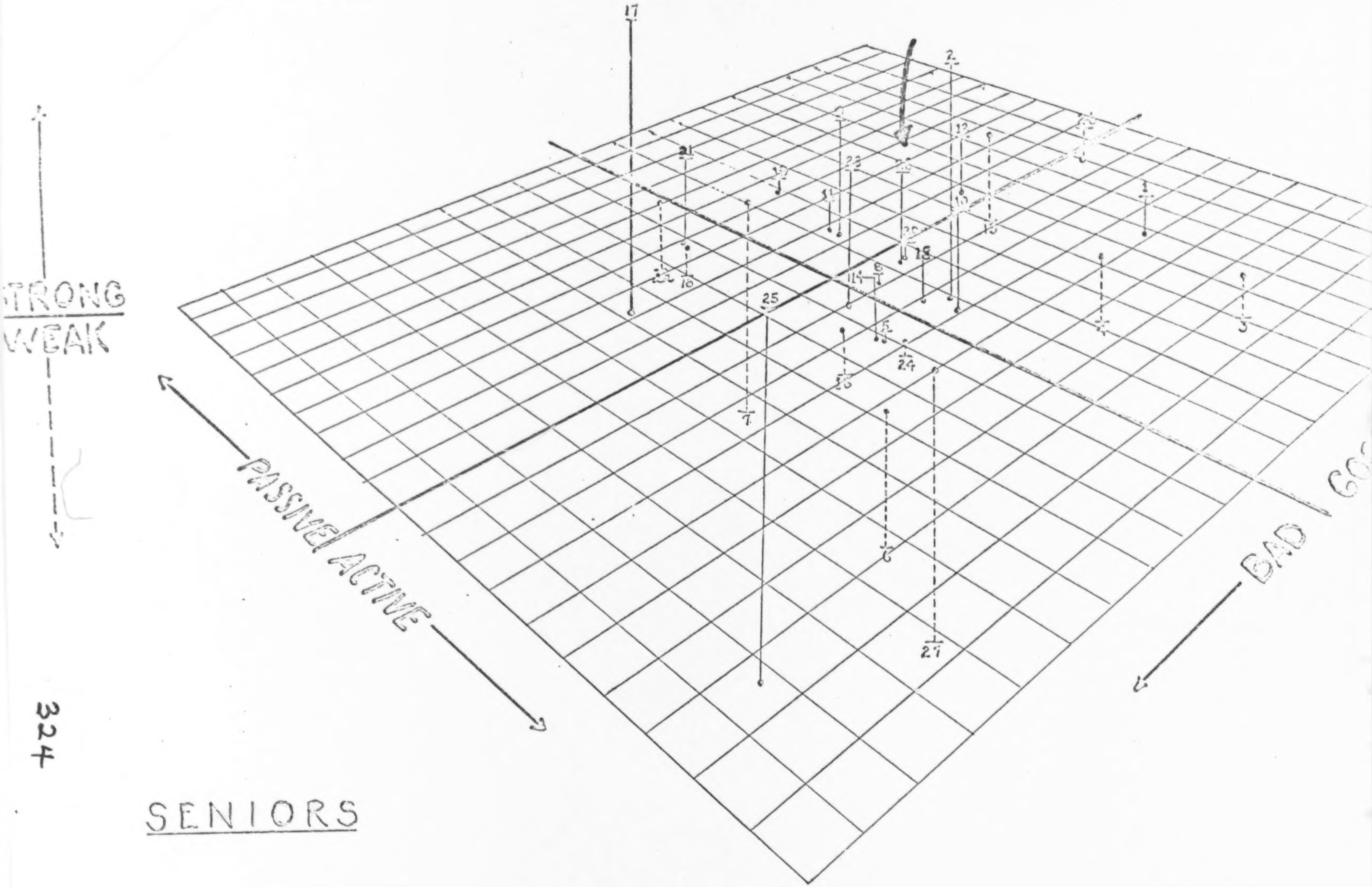
24
25
27


17
21
16
23
11
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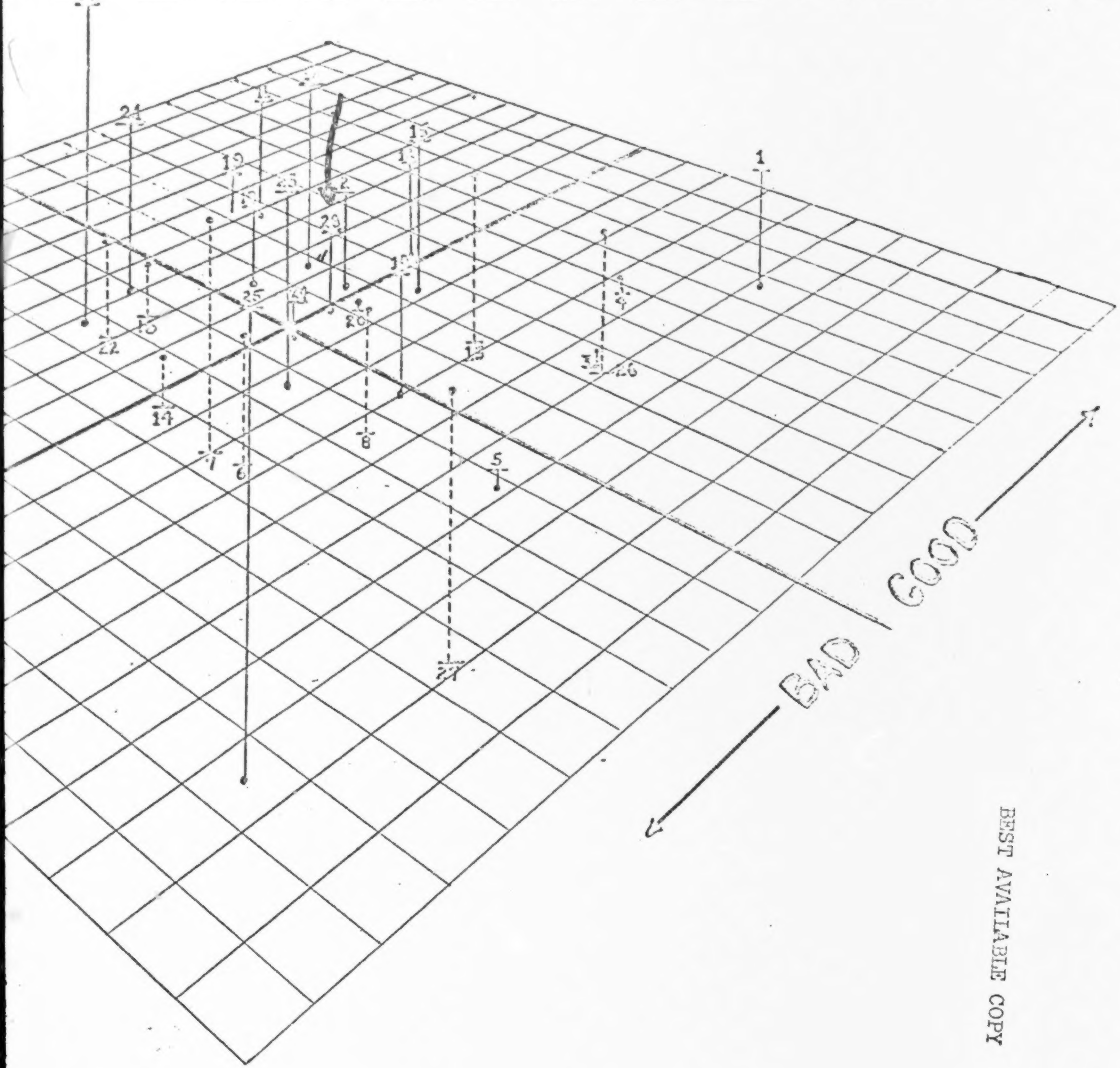
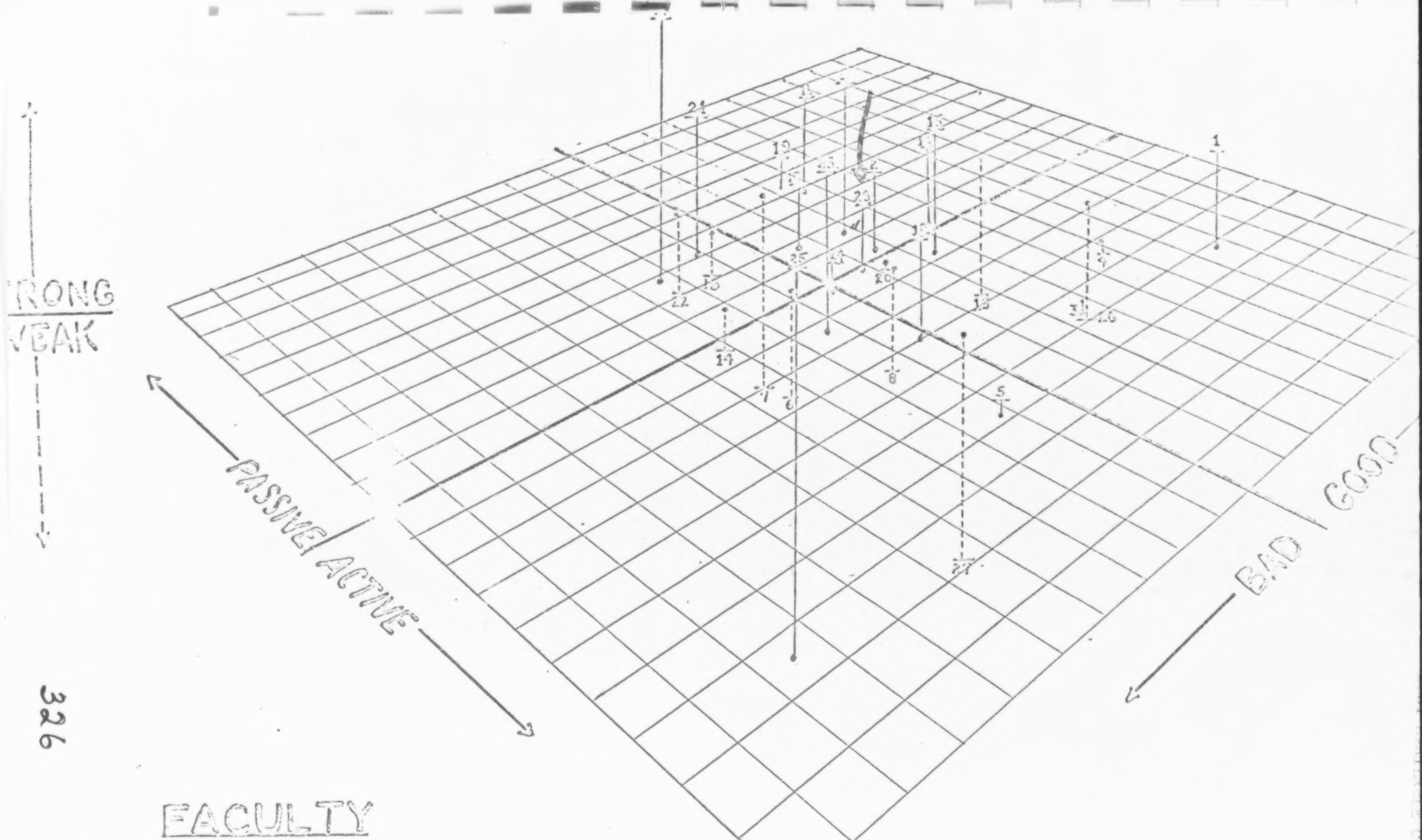
18
14
8
25
7
5
24
26
2
1
6
27
STRONG
WEAK
PASSIVE
ACTIVE
BAD
GOO

SENIORS



BEST AVAILABLE COPY


TRONG
VEAK
PASSIVE
ACTIVE
BAD
GOOD
1
4
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